Viglen BX130

User Manual

VIG385P

Viglen®

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COMPUTERS ■ NETWORKS ■ SOLUTIONS

Viglen, EMC and the 'CE' mark

CE Marking

European standards are being harmonised across borders. If products comply with the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies with the currently enforced directive(s).

CE

Introduction to EMC

EMC (Electromagnetic Compatibility) is the term used to describe certain issues with RF (Radio Frequency) energy. Electrical items should be designed so they do not interfere with each other through RF emissions. E.g. If you turn on your microwave, your television shouldn't display interference if both items are CE marked to the EMC directive.

If emitted RF energy is not kept low, it can interfere with other electrical circuitry - E.g. Cars Automatic Braking Systems have been known to activate by themselves while in a strong RF field. As this has obvious repercussions ALL electrical products likely to cause RF related problems have to be 'CE' marked from 1st January 1996 onwards.

If a product conforms to the EMC directive, not only should its RF emissions be very low, but its immunity to RF energy (and other types) should be high. The apparatus has to resist many 'real world' phenomena such as static shocks and mains voltage transients.

Viglen's Environment laboratory

To gain a 'CE' mark, the Viglen computer range has had to undergo many difficult tests to ensure it is Electromagnetically Compatible. These are carried out in the in-house 'Environment lab' at Viglen Headquarters. We have made every effort to guarantee that each computer leaving our factory complies fully with the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

- Install the system according to Viglen's instructions
- If you open up your Viglen:
    - Keep internal cabling in place as supplied.
    - Ensure the lid is tightly secured afterwards
    - Do not remove drive bay shields unless installing a 'CE' marked peripheral in its place
    - The clips or 'bumps' around the lips of the case increase conductivity - do not remove or damage.
    - Do not remove the ferrite ring from the L.E.D cables.
    - Only use your Viglen computer with 'CE' marked peripherals

This system has been tested in accordance with European standards for use in residential and light industrial areas-this specifies a 10 meter testing radius for emissions and immunity. If you do experience any adverse affects which you think might be related to your computer, try moving it at least 10 meters away from the affected item. If you still experience problems, contact Viglen's Technical Support department who will put you straight through to an EMC engineer - s/he will do everything possible to help. If modifications are made to your Viglen computer system, it might breach EMC regulations. Viglen take no responsibility (with regards to EMC characteristics) of equipment which has been tampered with or modified.

This symbol on the product or on its packaging indicates that the product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or Viglen Ltd.

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Contents

Chapter 1: System Overview

Introduction

This manual describes the chassis and Motherboard level features of the Viglen BX130. This pedestal system consists of a medium tower chassis and a 775-pin Intel Pentium 4 D processor supported Motherboard.

Table 1: Motherboard Features

Features	Description
Microprocessor	Pentium 4 – LGS775
Chipset	Intel 945G
Memory Capacity	4GB Maximum
PCI Bus	? 4 x 32 BIT PCI ? PCI-e x16 VGA Only ? PCI-e x8 VGA Only
ISA Bus	? PS2 Keyboard and Mouse ? Floppy Drive
IDE	? Single EIDE port supports Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 and ATA/100
SATA	Supports up to Four SATA hard drives. (Non RAID)
LAN Support	Integrated Intel 82573V GB LAN Controller
Chassis	522mm (height) x 205mm (width) x 473mm (depth)
Weight	11.5 kg without PSU
Power Supply	Single 350W power supply
Cooling	Two Chassis mounted 120 mm Rear and 80 mm Front fans
Hard disk bay	Support for four hard drives
Other External Drive Bays	Two standard 3.5” diskette drive bays (one occupied) Four 5 1/4” Drive bays (one occupied)

System Board Components

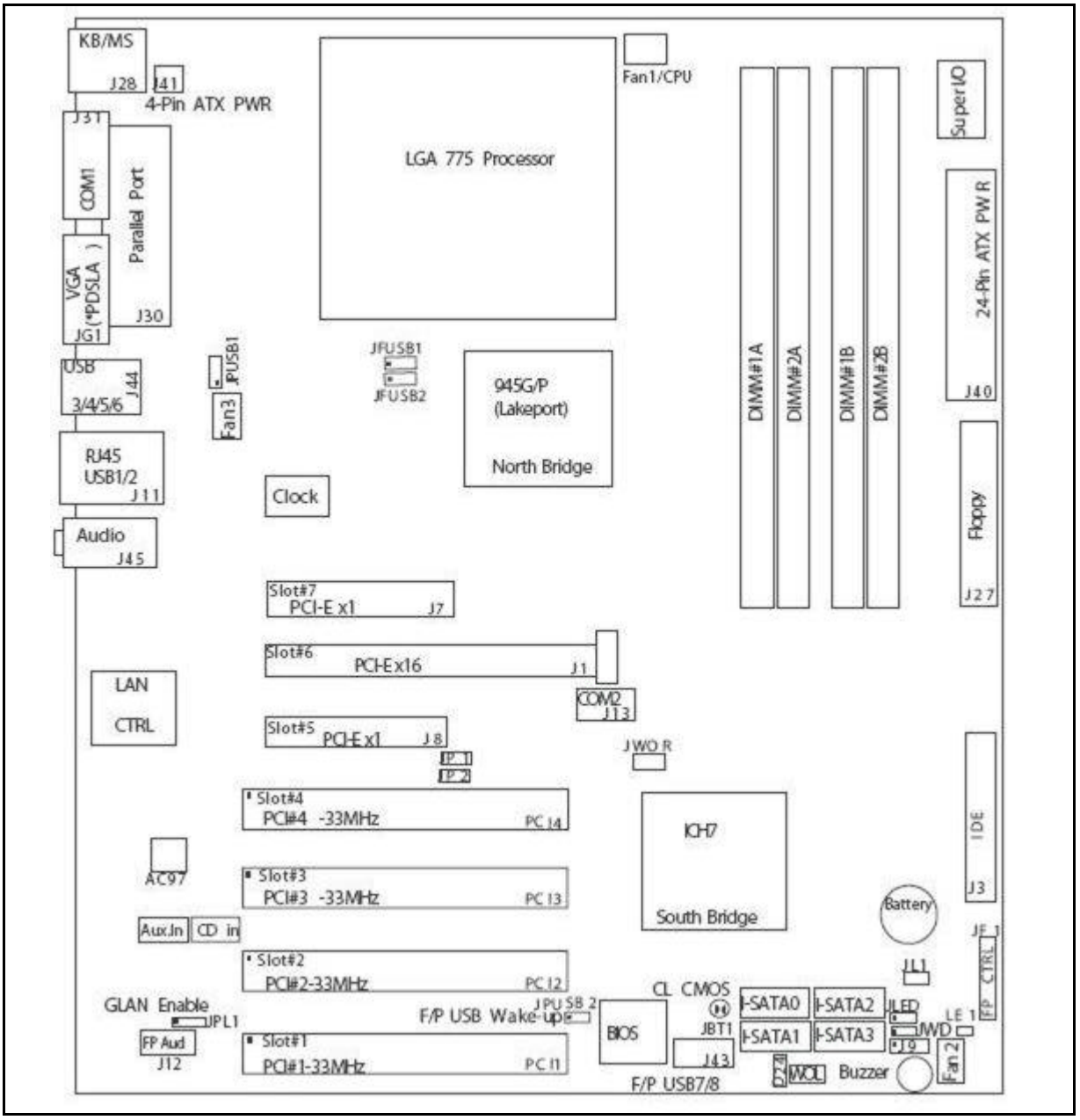


Figure 1: System Board Components

Chassis Overview

The galvanised metal chassis minimises EMI and radio frequency interference (RFI). The removable access cover is attached to the chassis with two screws (can be secured with locking handle) and provides easy access to the VIG385P Motherboard and power supply.

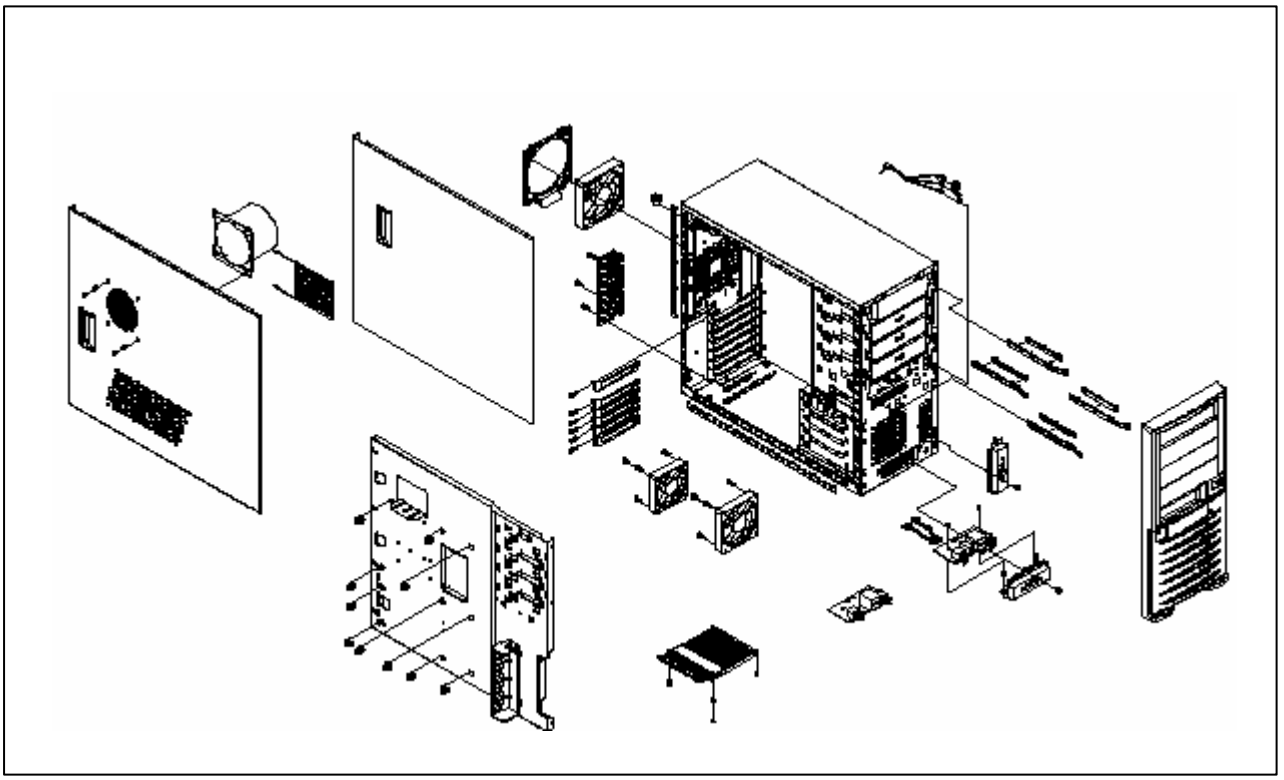


Figure 2: Chassis Overview

Controls, Connectors, and Indicators

Figure 3: Front Panel

Note: *The Front Panel on the BX130 has a Mini Door which when opening has Two Front USB ports. The Front Audio is not available.*

Control Panel Buttons

There is one push-button located on the front of the chassis; which is a power on/off button, shown in figure 4.

POWER: This is the main power switch, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

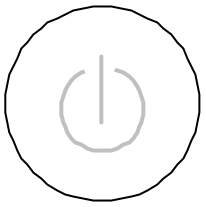


Figure 4: Main Power Button

Control Panel LEDs

The control panel provides system activity information. LEDs indicate power on and hard disk drive activity. The control panel also includes a main power button.

Back Panel Connectors

The Motherboard external IO connectors are attached to a metallic I/O shield. This shield serves several purposes:

? It protects the sensitive Motherboard from any external EMC interference.

? It stops the computer from interfering with other electrical devices.

? It allows the Motherboard to be easily upgraded in the future without having to resort to buying a whole new case. Simply change the I/O shield to match the Motherboard.

The I/O shield provides external access to PS/2 keyboard and mouse connectors as well as two serial ports, one parallel port, two USB ports and two LAN Ports.

The input/output connectors are accessible at the back panel of the chassis as shown in figure 5. The I/O ports are colour coded in conformance with the PC 99 specification.

***Note:* The mouse and keyboard must be plugged into their designated PS/2 ports. Power to the computer should be turned off before a keyboard or mouse is connected or disconnected.**

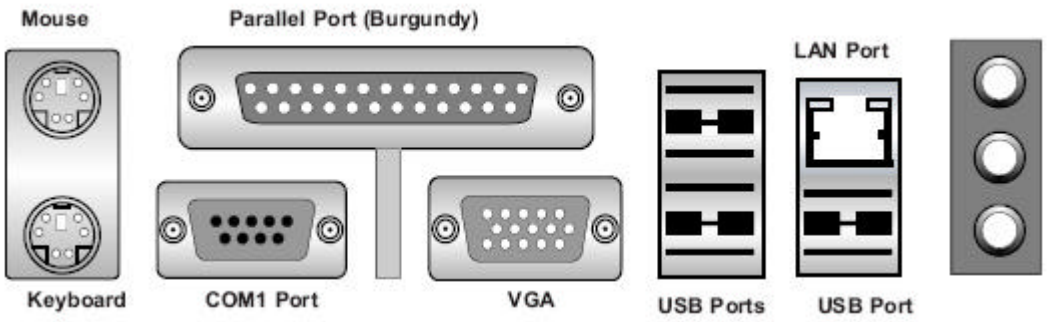


Figure 5: Back Panel Connectors

Feature Summary

The VIG385P Motherboard supports single Intel LGA775 Pentium 4 D processors with 1MB or 2MB of cache, operating at speeds of up to 3.8 GHz.

The Motherboard features:

Form factor:

? ATX Form Factor: 12inches(W) x 8.8inches(H)

Processor:

? Single Intel Pentium® D/Pentium® 4/Celeron Dual Core in the 775-Land Grid Array Package at a system bus speed of 1066/800/533 MHz.

? Supports Intel Hyper-Threading Technology.

Main memory:

? Four 240-pin DIMM sockets.

? Supports unbuffered, non-ECC single or dual channel DDRII with the bandwidth up to 5.3GB/s (DDRII 667) for single channel mode and 10.7 GB/s (DDRII 667) in dual-channel interleaved mode.

Chipset

? Intel Lakeport 945G/P Chipset

LAN

? Single Intel 82573V PCI-E Gigabit LAN Controller

Peripheral Interfaces

? Up to 6 USB 2.0 (Universal Serial Bus) ports
? One EPP/ECP parallel port
? Two EIDE Ultra DMA/100 bus master interfaces
? One floppy port interface
? PS/2 keyboard and mouse ports
? Support for up to four hard drives

Expansion Capabilities

- One (1) PCI-Express x16 (intended for graphics)
- One (1) PCI-Express x8 (PCI-Express x1 Signal)
- One (1) PCI-Express x1
- Four (4) 32-bit PCI 33MHz (5V)

BIOS

- 4 Mb Firmware Hub Award BIOS® Flash BIOS
- APM 1.2, DMI 2.3, PCI 2.2, ACPI 1.0, Plug and Play (PnP)

PC Health Monitoring

- Onboard voltage monitors for Chipset Core +1.5V, CPU core, +3.3V, +3.3V Standby, +5V, +5V Standby, Vbat (battery voltage) and ±12V
- Fan status monitor with firmware 4 pin fan speed control
- Fan Fail Alert LED and Beep
- SuperDoctor III, Watch Dog, NMI
- Environmental temperature monitoring via BIOS
- Power-up mode control for recovery from AC power loss
- System overheat LED and control
- System resource alert via Supero Doctor III
- Auto-switching voltage regulator for the CPU core

ACPI Features (optional)

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Main switch override mechanism
- Internal/external modem ring-on

Other

- Wake-on-LAN
- Wake-on-Ring (WOR)
- System Bus Clock Frequency Selection
- Suspend-to-RAM
- Onboard +5V Standby Power Warning LED ("LE1")

CD/Diskette Utilities

- BIOS flash upgrade utility
- Drivers and software for Intel 945G/P chipset utilities

Dimensions

? ATX, 11.5" x 9.5" (292 x 242 mm)

Microprocessor

The Motherboard supports a single 775-pin Pentium 4 processor of up to 3.8GHz. In addition, the front side bus speed is automatically selected. The Motherboard currently supports processors that run internally up to 3.8GHz and have a 512Kb/1MB second-level cache running at full CPU Speed.

Microprocessor Packaging

The Intel Pentium processor connects to the Motherboard through a LGA775 connector.

Processor Upgrades

The Motherboard can be upgraded with an Intel Pentium processor that runs at higher speeds.

Main Memory

The VIG385P supports unbuffered, non-ECC single or dual channel DDRII with the bandwidth up to 5.3GB/s (DDRII 667) for single channel mode and 10.7 GB/s (DDRII 667) in dual-channel Interleaved mode.

The Motherboard supports the following memory features:

? 240-pin DIMMs
? DDRII-400/533/667
? Up to a maximum of 4GB of ram
? Non-ECC un-buffered DDRII memory.

DDRII Memory

Double Data Rate (DDRII) SDRAM is an established, high-bandwidth DRAM technology that is cost-effective and suitable for every PC market segment. This Motherboard only accepts DDR memory modules which are keyed so not to confuse it with any other type of memory.

ECC Memory

Error checking and correcting (ECC) memory detects multiple-bit errors and corrects single-bit errors. ECC memory must be installed for the system to function correctly.

Chipset

Intel's Lakeport (945G/P) chipset consists of two primary components: the Graphics Memory Controller Hub (GMCH)/Memory Controller Hub (MCH) and the I/O Controller Hub (ICH7). Optimized for the Celeron, Pentium 4, Pentium D processors in an LGA775 Package, the Lakeport (945G/P) provides the performance and feature-set required for high-end UP dual core processor desktop solutions.

The GMCH/MCH supports high-performance integrated graphics and manage the data fl ow of the following fi ve interfaces: the CPU interface, DDR2 interface, PCI Express Graphic Interface, the DMI (Direct Media Interface) and integrated graphics with display interfaces (*GMCH only) . The GMCH/MCH supports a FSB frequency of 533/800/1066 MHz using a scalable CPU. It supports up to two channels of non-ECC DDR2 400/533/667 SDRAM. The integrated Graphics Controller provides 3D, 2D and display capabilities. The GMCH/MCH also supports advanced desktop power management.

Universal Serial Bus (USB)

The Motherboard can support up to eight USB ports; two USB ports can be located on the I/O shield. For more than two USB devices, two USB headers can be connected to the board. The Motherboard fully supports the universal host controller interface (UHCI) and uses UHCI-compatible software drivers. USB features include:

- Self-identifying peripherals that can be plugged in while the computer is running.
- Automatic mapping of function to driver and configuration.
- Supports isochronous/asynchronous transfer types over the same set of wires.
- Supports up to **127** physical devices.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.
- Error-handling and fault-recovery mechanisms built into the protocol.

***Note:* Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed (sub-channel) USB device is attached to the cable. Use shielded cable that meets the requirements for high-speed (fully rated) devices.**

IDE Support

The VIG385P Motherboard has one independent bus-mastering PCI IDE interface. These interface supports PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), Ultra DMA/33, Ultra DMA/66 & Ultra DMA/100 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

Real-time Clock, CMOS SRAM, and Battery

The clock provides a time-of-day clock and a multi-century calendar with alarm features and century rollover.

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program.

An external coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3-V standby current from the power supply extends the life of the battery. The clock is accurate to ? 13 minutes/year at 25 ºC with 3.3V applied.

I/O Interface Controller

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems. The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP), Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP). The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption. The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Serial Ports

One 9-pin D-Sub serial port connector is located on the back panel and is compatible with NS16C550 UARTs.

Intel ICH7 System Features

The ICH7 provides extensive I/O support to a high-end 945G/P system. Functions and capabilities include:

- PCI Express Base Specification, Rev. 1.0a-compliant
- PCI 2.3 with support for 33 MHz PCI operations
- ACPI Power Management Logic Support
- Integrated Serial ATA host controller with independent DMA operation on four ports, (with support of SATA I and SATA II HDD)
- Integrated IDE controller supports Ultra ATA 100/66/33
- USB host interface with support for eight USB ports
- Enhanced DMA Controller, interrupt controller, and timer functions
- System Management Bus (SMBus) 2.0 with additional support for I^2C devices
- Low Pin Count (LPC) Interface
- Firmware Hub (FWH) Interface
- Audio Codec '97 Rev. 2.3 which provides a link for Audio (up to 6 channels)

Parallel Port

The connector for the multimode bidirectional parallel port is a 25-pin D-Sub connector located on the back panel. In the Setup program, the parallel port can be configured for the following:

- Compatible (standard mode).
- Bidirectional (PS/2 compatible).
- Extended Parallel Port (EPP).
- Enhanced Capabilities Port (ECP).

Floppy Controller

The I/O controller is software compatible with the N82077 floppy drive controllers and supports both PC-AT and PS/2 modes. In the Setup program, the floppy interface can be configured for the following floppy drive capacities and sizes:

- 360 KB, 5.25-inch
- 1.2 MB, 5.25-inch
- 720 KB, 3.5-inch
- 1.2 MB, 3.5-inch (driver required)
- 1.25/1.44 MB, 3.5-inch
- 2.88 MB, 3.5-inch

PS/2 Keyboard and Mouse Interface

PS/2 keyboard and mouse connectors are located on the back panel. The +5 V lines to these connectors are protected with a PolySwitch circuit that, like a self-healing fuse, re-establishes the connection after an over-current condition is removed.

The keyboard controller contains the AMI Megakey keyboard and mouse controller code, provides the keyboard and mouse control functions, and supports password protection for power on/reset. A power on/reset password can be specified in Setup.

The keyboard controller also supports the hot-key sequence <Ctrl><Alt><Del> for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

Management Extension Component

Wake on LAN Header

The optional Wake on LAN header enables remote wakeup of the computer through a network. Wake on LAN requires a PCI add-in network interface card (NIC) with remote wakeup capabilities. The remote wakeup header on the NIC must be connected to the onboard Wake on LAN header. The NIC monitors network traffic at the MII interface and when it detects a Magic Packet it asserts a wakeup signal that powers up the computer.

***Note:* For Wake on LAN, the 5-V standby line for the power supply must be capable of delivering 5 V ±5 % at 720 mA.**

Wake on Ring Header

The optional Wake on Ring allows the computer to wake from sleep mode when a call is received on a telephony device, such as a modem, configured for operation on COM1. The first incoming call powers up the computer. A second call must be made to access the computer.

System BIOS

The BIOS (Basic Input Output System) is an important piece of software which is stored in a ROM (Read Only Memory) chip inside the computer. It consists of the basic instructions for controlling the disk drives, hard disk, keyboard and serial/parallel ports. The BIOS also keeps a list of the specifications of the computer in battery-backed RAM (also known as the CMOS RAM) and provides a special Setup program to change this information.

The Motherboard uses a 4Mb Flash BIOS, which is stored in a flash EEPROM and can be upgraded using a disk-based program. In addition to the BIOS, the flash memory contains the Setup program, Power-On Self Test (POST), the PCI auto-configuration utility, and is Windows 95-ready Plug and Play. This Motherboard supports system BIOS shadowing, allowing the BIOS to execute from 64-bit onboard write-protected DRAM.

The BIOS displays a message during POST identifying the type of BIOS and the revision code.

PCI Auto Configuration

The PCI auto-configuration utility works in conjunction with the Set-up program to support using PCI add-in boards in the system. When you turn on the system power after installing a PCI board, the BIOS automatically configures interrupts, DMA channels, I/O space, and so on. Since PCI add-in boards use the same interrupt resources as ISA add-in boards, you must specify the interrupts used by ISA boards in the set-up program. The PCI auto-configuration program complies with version 2.1 of the PCI BIOS specification.

IDE Auto Configuration

If you install an IDE drive in the system, the IDE auto-configuration utility automatically detects and configures the drive for operation in the system. This utility eliminates the need to enter the Set-up program after you install an IDE drive.

Expansion Slots

The system has four PCI bus add-in card connectors and One AGP universal connector.

- One (1) PCI-Express x16 (intended for graphics)
- One (1) PCI-Express x8 (PCI-Express x1 Signal)
- One (1) PCI-Express x1
- Four (4) 32-bit PCI 33MHz (5V)

Chapter 2: System Board Options

The VIG385P Motherboard is capable of accepting one Intel Pentium 4 CPU. RAM can be upgraded to a maximum of 4GB using DDRII DIMMs non/ECC unbuffered memory.

WARNING

Unplug the system before carrying out the procedures described in this chapter. Failure to disconnect power before you open the system can result in personal injury or equipment damage. Hazardous voltage, current, and energy levels are present in this product. Power switch terminals can have hazardous Voltages present even when the power switch is off.

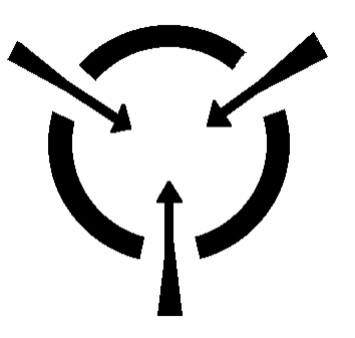
The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.
Do not operate the system with the cover removed. Always replace the cover before turning on the system.

As the colours of the wires in the mains lead of this computer may not correspond with the coloured markings identifying the terminals in your plug precede as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter **E** or by the safety Earth symbol Q or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter **N** or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter **L** or coloured red.



CAUTION!

The Viglen VIG385P motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.

Make sure you are earthed and free of static charge before you open the computer case. If you are unsure about upgrading your computer, return it to Viglen so a qualified engineer can perform the upgrade.

STEPS TO TAKE TO PREVENT STATIC DISCHARGE:

1. The best way to prevent static discharge is to buy an anti-static strap from your local electrical shop. While you are wearing the strap and it is earthed, static charge will be harmlessly bled to ground.

2. Do not remove the component from its anti-static protective packaging until you are about to install it.

3. Hold boards by the edges - try not to touch components / interface strips etc.

***Note:* We recommend that you return your computer to the service department for upgrading. Any work carried out is fully guaranteed. Upgrades should only be carried out by persons who are familiar with handling IC's, as incorrect installation will invalidate the guarantee.**

Overview of Jumper Settings

The VIG385P Motherboard contains various jumpers, which are manually set up to provide the optimum performance configuration. This section will explain the different jumpers to you and the various configurations.

Caution!

Never remove jumpers using large pliers as this can damage the pins. The best way to remove a jumper is to use a small pair of tweezers or fine needle-nosed pliers.

Never remove a jumper when the computer is switch on. Always switch the computer off first.

Do not move the jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing the jumper.

Jumper Settings

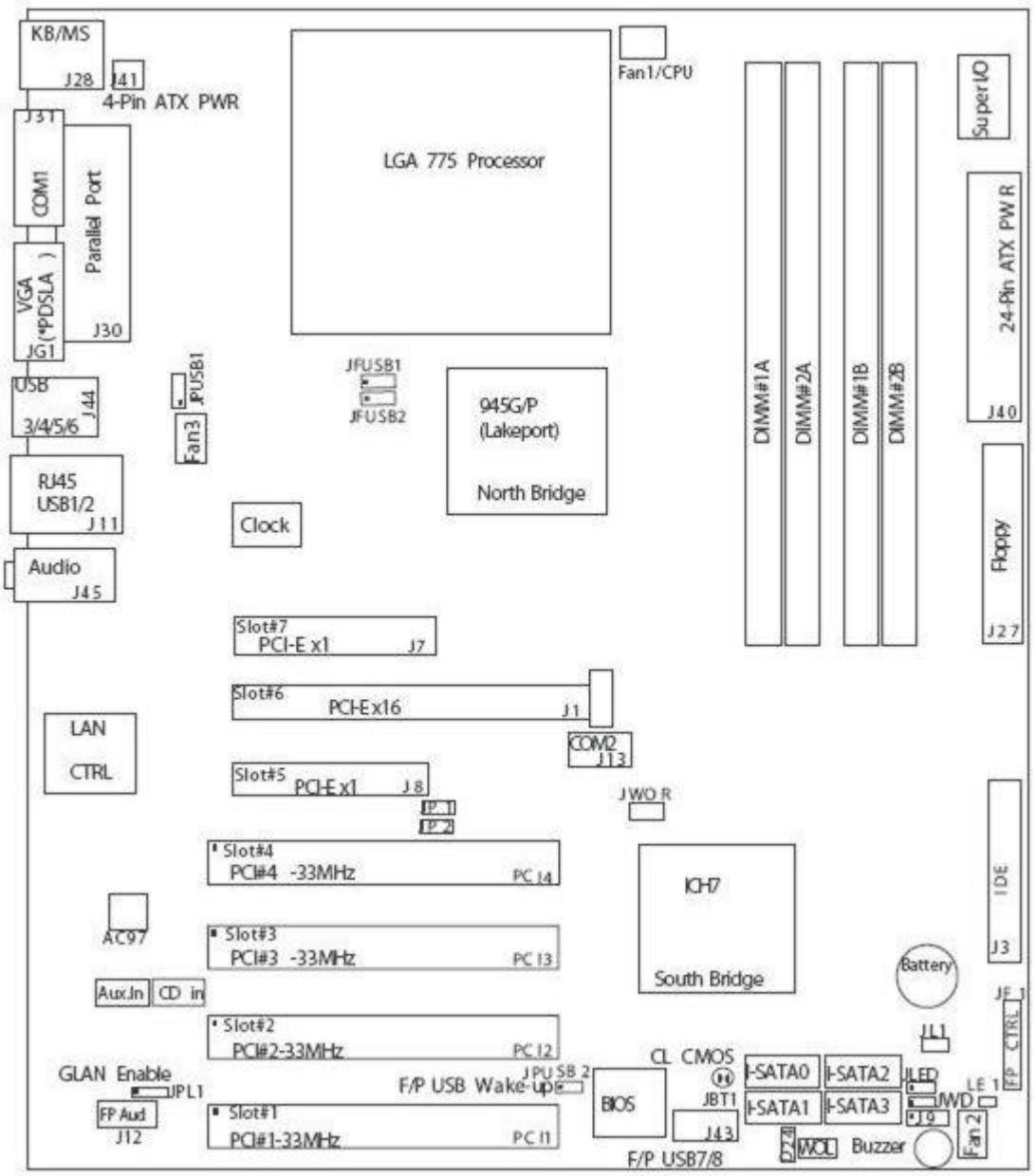


Figure 6: Jumper Settings

Table 1: Jumper Settings

JPUSB1 & JPUSB2: USB Wake-Up	Use JPUSB jumpers to enable the function of "System Wake-Up via USB devices", which allows you to "wakeup" the system by depressing a key on the USB keyboard or by clicking the USB mouse of your system. The JPUSB jumpers are used together with the USB Wake-Up function in the BIOS. Enable both the jumpers and the BIOS setting to allow the system to "wake-up via USB Devices". (*Note: JPUSB1 is for Back Panel USB ports:1/2/3/4/5/6, and JPUSB2 is for Front Panel USB ports:7/8.) (*Note: The default jumper setting for the USB ports is "Disabled". However, when the "USB Wake-Up" function is enabled in the BIOS and the desired USB ports are enabled via the JPUSB jumper, please be sure to remove all USB devices from the USB ports whose USB jumpers are set to "Disabled" before the system goes into the standby mode.)
JP5: Watch Dog	JP5 enables the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is "hung up". Pins 1-2 will cause WD to reset the system if an application is "hung up". Pins 2-3 will generate a non-maskable interrupt signal for the application that is "hung up".
JFSB1 & JFSB2 CPU FSB speed	JFSB1 and JFSB2 allow you to set the Front Side Bus Frequency. (*Default is Auto.)

CAUTION!

Do not move the jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing the jumper.

Motherboard Connectors

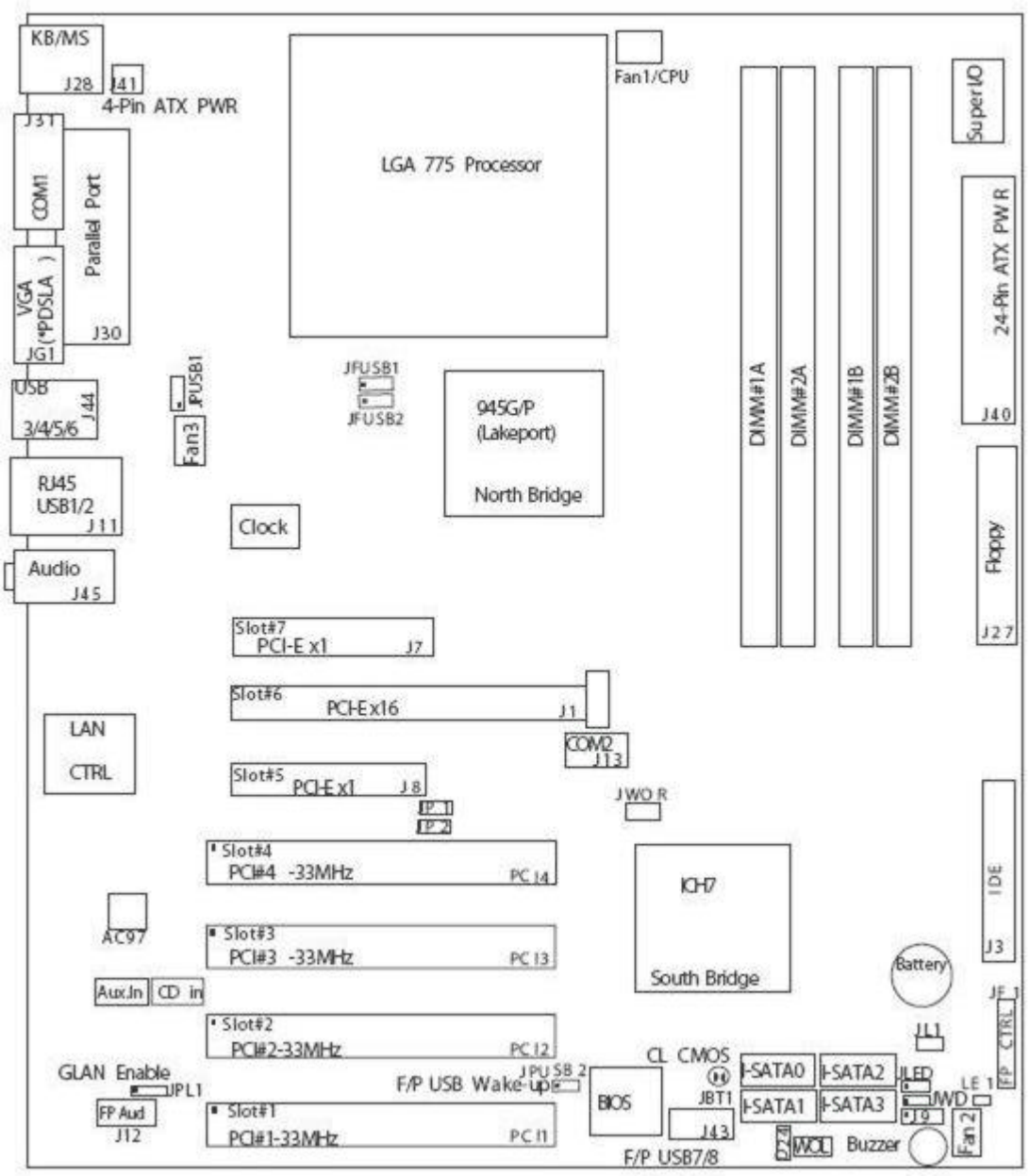


Figure 7: Motherboard Connectors

Note: ***All the connectors on the Motherboard shown in Figure 7 are keyed in order to prevent incorrect insertion. These are denoted in the above picture by the black/dark areas.***

Front Panel Connectors

The following are all connectors situated along the front edge of the Motherboard. They are often connected to buttons and LED's situated on the front panel.

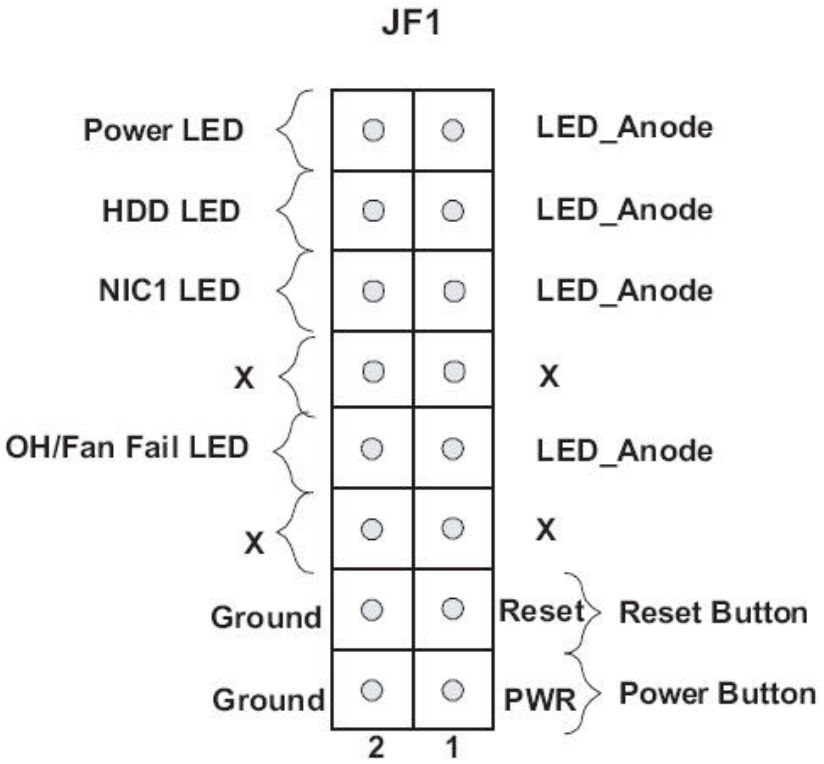


Figure 8: Front Panel Connectors

Table 2: Front Panel Connectors

Power LED:	The power LED connection is located on pins 15 and 16.
HDD LED:	The HDD LED connection is located on pins 13 and 14. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SATA and IDE)
Power Button:	The power button connection is located on pins 1 and 2 Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the bios). To turn off the power when set to suspend mode, depress the button for at least 4 seconds.

Upgrading the CPU

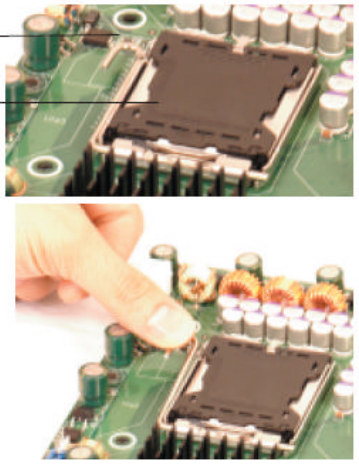
CAUTION!

Allow time for the processor and heatsink to cool before touching either of them.

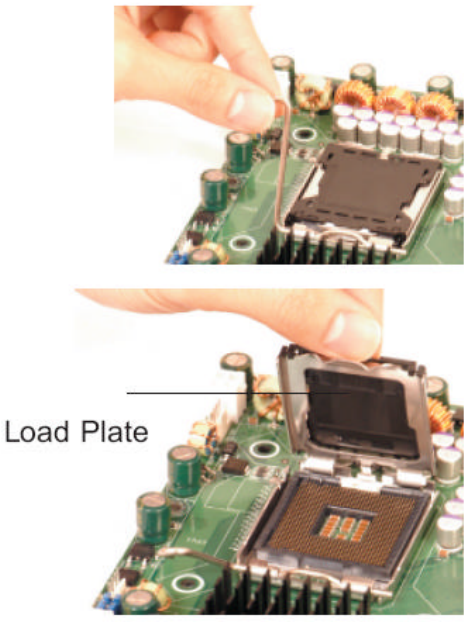
***NOTE:* When installing a single CPU it MUST be installed in the CPU slot for the system to work. The CPU slot nearest the edge of the Motherboard. Refer to the System board components page for the clear location of CPU.**

Figure 9: Heatsink components

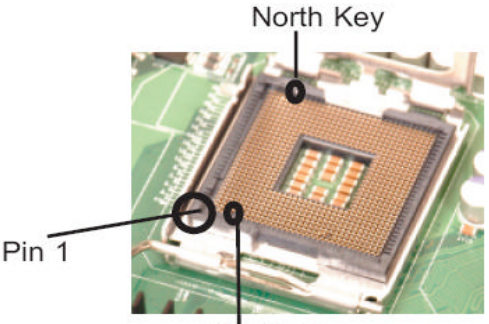
1. Press the socket lever to release the load plate, which covers the CPU socket, from its locking position.



2. Gently lift the socket lever to open the load plate.

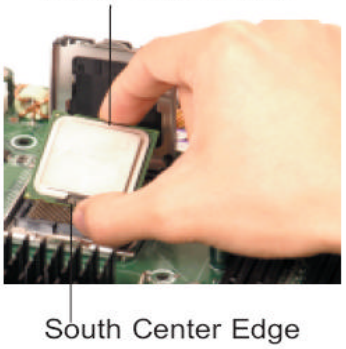


3. Locate Pin 1 on the CPU socket. (*Note: Pin 1 is the corner marked with a triangle). Please note that the North Key and the South Key are located vertically in the CPU housing.



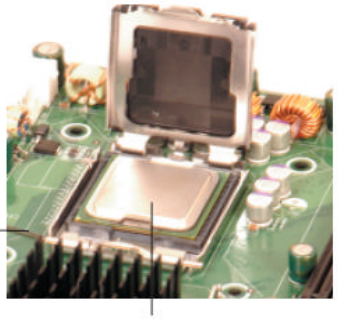
4. Position the motherboard in such a way that Pin 1 of the CPU socket is located at the left bottom of the CPU housing.

5. Use your thumb and your index finger to hold the CPU at the North Center Edge and the South Center Edge of the CPU.

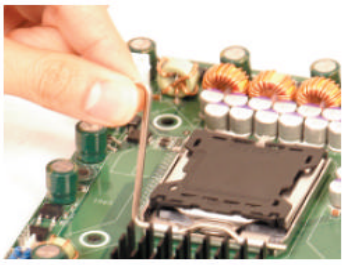


6. Align Pin 1 of the CPU with Pin 1 of the socket. Once aligned, carefully lower the CPU straight down to the socket. (**Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damage to the CPU or the socket.)

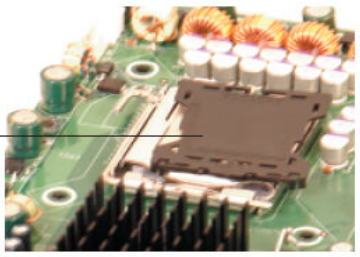
7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.



8. Use your thumb to gently push the lever down and lock it in the hook.



9. If the CPU is properly installed into the socket, the plastic cap will be automatically released from the load plate when the lever is pushed into the hook. Remove the plastic cap from the motherboard.



1. Locate the CPU Fan on the motherboard. (Refer to the layout on Page 1-4 for the CPU Fan location.)

2. Position the heatsink in such a way that the heatsink fan wires are closest to the CPU fan and are not interfered with other components

3. Inspect the CPU Fan wires to make sure that the wires are routed through the bottom of the heatsink.

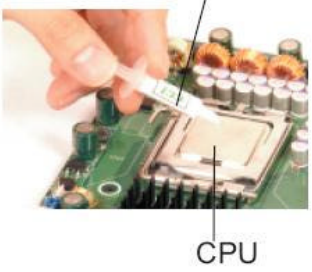
4. Remove the thin layer of the protective film from the copper core of the heatsink.

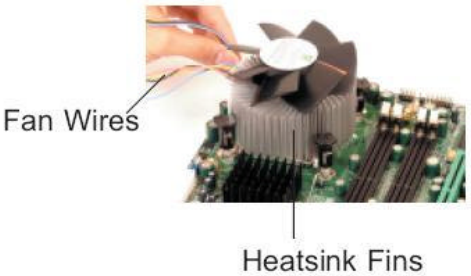
(*Warning: CPU overheat may occur if the protective film is not removed from the heatsink.)

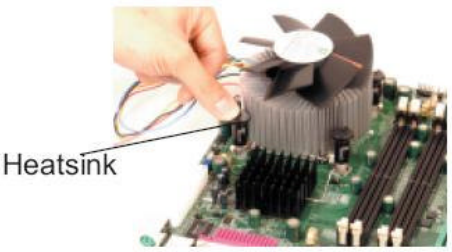
5. Apply the proper amount of thermal grease on the CPU. (*Note: if your heatsink came with a thermal pad, please ignore this step.)

6. If necessary, rearrange the wires to make sure that the wires are not pinched between the heatsink and the CPU. Also make sure to keep clearance between the fan wires and the fins of the heatsink.

7. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push the fasteners into the mounting holes until you hear a "click".







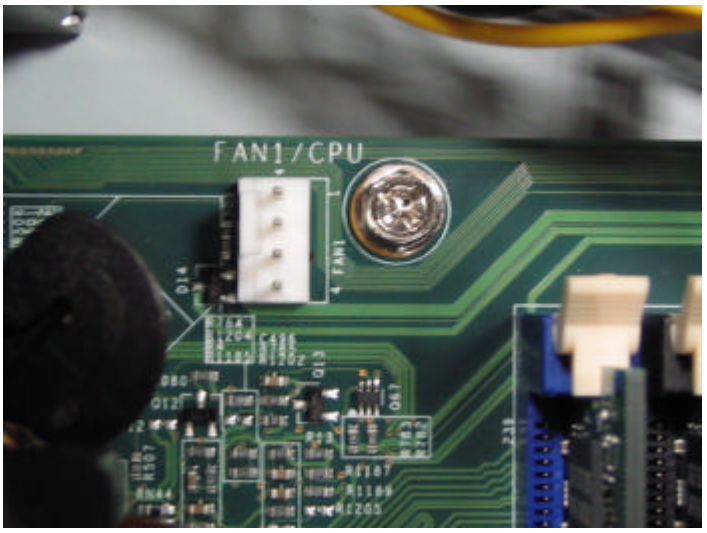


Figure 10: CPU Fan Header

Note: Connect the CPU fan to the respective CPU fan connector.

Introduction to Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates from 150MBps. The second generation SATA can support up to 300 MBps theoretically. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Located in the South Bridge of the Intel Lakeport (945G/P) chipset, the ICH7 I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 1-channel Ultra ATA/100 Bus Master IDE controller (PATA) and four Serial ATA (SATA) Second Generation Host Controllers, which support up to four Serial ATA ports and four hard drives. The ICH7 I/O Controller Hub supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

SATA Operate Modes

You can select from the following modes: Auto, Combined, Enhanced, and SATA only Mode. The number of devices supported by these modes are listed below:

*SATA Only: The maximum of 4 devices are supported (4 SATA)
*Auto Mode: The maximum of 6 devices supported (4 SATA + 2 IDE)
*Enhanced Mode: The maximum of 6 devices supported (4 SATA + 2 IDE)
*Combined Mode: The maximum of 4 devices supported (2 SATA + 2 IDE)

Installing & Removing Dual In-line Memory Modules

Installing Memory

CAUTION!

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance.

1. Insert the desired number of DIMMs into the memory slots, starting with Bank one (memory slot nearest the CPU's). The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.

2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly, it is keyed so the memory can only be inserted one way.

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

The VIG385P only supports up to 4 GB of non/ECC, unbuffered DDR-667/533/400 SDRAM.

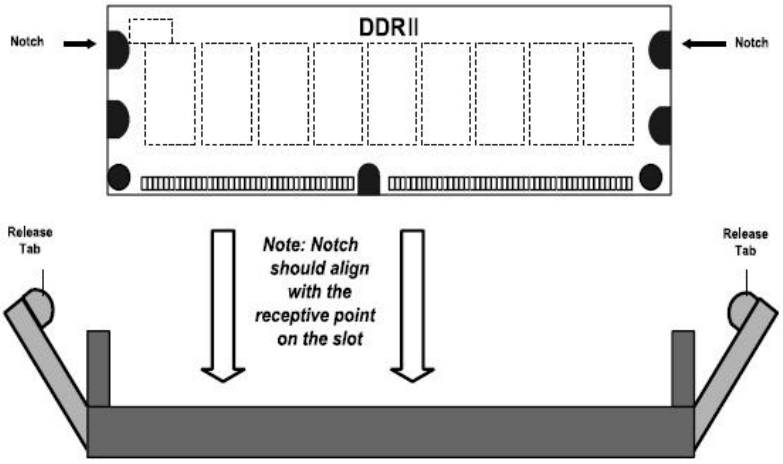


Figure 11: Installing Memory

Removing Memory

To remove a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin".

2. Turn off all peripheral devices connected to the computer. Turn off the computer.

3. Remove the computer cover.

4. Gently spread the retaining clips at each end of the socket. The RIMM pops out of the socket.

5. Hold the DIMM by the edges, lift it away from the socket, and store it in an antistatic package.

6. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.

Replacing the Clock/CMOS RAM Battery

A lithium battery is installed in a socket on the system board. The battery has an estimated life expectancy of seven years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

If the battery fails, you will need to replace it with a **3V** battery or an equivalent. As long as local ordinance permits, you may dispose of individual batteries as normal rubbish. Do not expose batteries to excessive heat or any naked flame. Keep all batteries away from children.

CAUTION!

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Viglen. Discard used batteries according to manufacturer's instructions.

The battery can be found using Figure 12. It is located on the bottom left hand side of the Motherboard. To replace the battery, carry out the following:

1. Before commencing any work inside your Viglen system please read the warnings and cautions at the beginning of this Chapter.
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. Find the battery location on the Motherboard.
5. Remove any components that are blocking access to the battery.
6. Gently pry the battery free from its socket, taking care to note the "+" and "-" orientation of the battery.
7. Install the new battery in the socket.

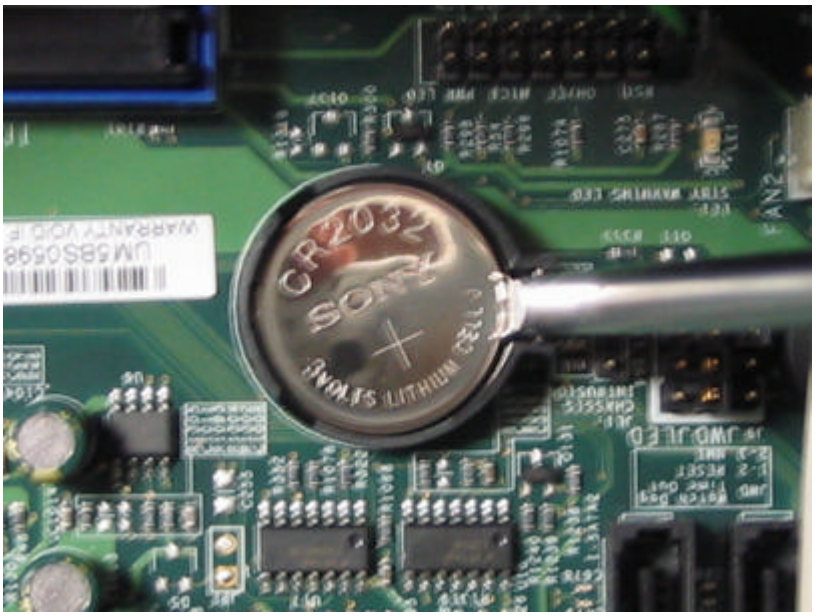


Figure 12: Replacing the CMOS Battery

8. GENTLY push a flathead screwdriver as shown in Figure 12.
9. Then pry the battery out of the socket.

Chapter 3: Solving Problems

The first part of this chapter helps you identify and solve problems that might occur when the system is in use. The second part lists error code messages that might be displayed.

Please remember that if you cannot solve the problem by yourself then you should contact your suppliers Technical Support for further assistance.

Viglen Technical Support can be reached in the following ways:

Telephone: 08705 922 922
Fax: 01727 201 858
Email: techsupport@viglen.co.uk

You can also look for support information on our web site:

http://www.viglen.co.uk

Device drivers and various useful utilities can be downloaded from our ftp site:

ftp://ftp.viglen.co.uk

Resetting the System

Before checking your system for hardware problems, it is always a good idea to try resetting your computer and see if a re-boot can solve the problem. Most software related problems can be solved simply by re-booting your PC.

Table 3: Resetting the System

To do the following	Press
Soft boot: Clear the system memory and reload the operating system (also called warm reset).	<Ctrl + Alt + Del>
Cold boot: Clear the system memory, halt power to all peripherals, restart POST, and reload the operating system.	Power off/on (at front of the system)

Troubleshooting Procedure

This section provides a step-by-step troubleshooting procedure to identify a problem and locate its source.

CAUTION!

1. Turn off the system and any peripheral devices before you disconnect any peripheral cables from the system. Otherwise, you can permanently damage the system or the peripheral devices.

2. Make sure the system is plugged into a properly grounded power outlet.

3. Make sure your keyboard and video display are correctly connected to the system. Turn on the video display, and turn up its brightness and contrast controls to at least two-thirds of the maximum (refer to the documentation supplied with the video display).

4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in the diskette drive. If the operating system normally loads from a diskette, insert the operating system diskette into the drive.

5. Turn on the system. If the power indicator does not light, but the system seems to be operating normally, the indicator is probably defective. Monitor the power-on self test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.

***Note:* If the POST does not detect any errors, the system beeps once and boots up.**

Errors that do not prevent the boot process (non-fatal errors) display a message that looks similar to the following:

Error Message Line 1
Error Message Line 2
Press <F2> for Set-up, <F1> to Boot
You can note the error and press <F1> to resume the boot-up process, or <F2> to enter Set-up.

Errors that prevent the boot process from continuing (fatal errors), are communicated by a series of audible beeps. If this type of error occurs, refer to the error codes and messages listed at the end of this chapter.

6. Confirm that the operating system has loaded.

Problems Operating Add-in Boards

Problems related to add-in boards are usually related to improper board installation or interrupt and address conflicts. Go through the checklist below to see if you can correct the problem. If the problem persists after you have checked and corrected all of these items, contact the board vendor's customer service representative.

Did you install the add-in board according to the manufacturer's instructions?

Check the documentation that came with the board.

Are all cables installed properly?

The following items are suggestions for troubleshooting problems related to PCI/ISA legacy (non-Plug and Play) add-in boards.

- If the PCI/ISA board uses an interrupt, run Set-up and set the interrupt that is being used by the PCI/ISA board to Used by PCI/ISA Card. Please refer to the BIOS manual for details of how to do this.

- If the PCI/ISA legacy board uses memory space between 80000H - 9FFFFH, run Set-up and set conventional memory to 256K.

- If the PCI/ISA legacy board uses shared memory between C8000H - DFFFH, run Set-up and enable shared memory for the appropriate memory space.

Problems and Suggestions

Table 4: Problems and Suggestions

What Happens	What to Do
Before Power On	1. Check that the Standby Power LED is not lit (LE1 on Motherboard). 2. Make sure no short circuits exist between the Motherboard and chassis. 3. Disconnect all ribbon/wire cables from the Motherboard, including those for the keyboard and mouse. 4. Remove all add-on cards. 5. Install a CPU and heatsink (making sure it is fully seated) and connect the chassis speaker and the power LED to the Motherboard. Check all jumper settings as well. 6. Use the correct type of onboard CMOS battery as specified by the Manufacturer. Do not install the CMOS battery upside down to avoid possible explosion. 7. Make sure the 4-pin 12v power connector at J41 is connected to your power supply.
No Power	1. Make sure no short circuits exist between the Motherboard and the chassis. 2. Verify that all jumpers are set to their default positions. 3. Check that the 115V/230V switch on the power supply is properly set. 4. Turn the power switch on and off to test the system. 5. The battery on your Motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
No Video	1. If the power is on but you have no video, remove all the add-on cards and cables. 2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.
Memory Errors	1. Make sure that the DIMM modules are properly and fully installed. 2. You should be using unbuffered DDRII memory (see next page). Also, it is recommended that you use the same memory speed for all DIMMs in the system. See Section 2-4 for memory limitations. 3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results. 4. Check the power supply voltage 115V/230V switch.
Characters on the screen are distorted or incorrect	1. Make sure the brightness and contrast controls are properly adjusted on the monitor. 2. Make sure the video signal cable and power cables are properly installed. 3. Make sure your monitor is compatible with the video mode you have selected.
Diskette drive light does not go on when drive is in use or is tested by POST	1. Make sure the power and signal cables for the drive are properly installed. 2. Check that the drive is properly configured and enabled in Setup.

Application software problems	1. Make sure all cables are installed correctly. 2. Verify that the system board jumpers are set properly. 3. Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings you recorded previously. If an error is evident (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change. 4. Make sure the software is properly configured for the system. Refer to the software documentation for information. 5. Try a different copy of the software to see if the problem is with the copy you are using. 6. If other software runs correctly on the system, contact the vendor of the software that fails. 7. If you check all of the above with no success, try clearing CMOS RAM and reconfiguring the system. Make sure you have your list of system settings available to re-enter, because clearing CMOS RAM sets the options to their default values.
Hard drive light does not go on when drive is in use or is tested by POST	1. Make sure the power and signal cables for the drive are properly installed. 2. Make sure the front panel connector is securely attached to the system board headers. 3. Check that the drive is properly configured and enabled in Setup. 4. Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.
Power-on light does not go on	If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.
Prompt doesn't appear after system boots	A serious fault may have occurred consult your Viglen Technical Support.
Setup, can't enter	If you can't enter Setup to make changes, clear CMOS RAM to the default values and reconfigure the system in Setup.
System halts before completing POST	This indicates a fatal system error that requires immediate service attention. Note the screen display and write down any beep code emitted. Provide this information to your Viglen Technical Support.

Error and Information Messages

The rest of this chapter describes beep codes, and error messages that you might see or hear when you start up the system:

BIOS Error Messages

Table 5: BIOS Error Messages

Error Message	Explanation
Diskette drive A error or Diskette drive B error	Drive A: or B: is present but fails the POST diskette tests. Check that the drive is defined with the proper diskette type in Setup and that the diskette drive is installed correctly.
Extended RAM Failed at offset: *nnnn*	Extended memory not working or not configured properly at offset *nnnn*.
Failing Bits: *nnnn*	The hex number nnnn is a map of the bits at the RAM address (System, Extended, or Shadow memory) that failed the memory test. Each 1 in the map indicates a failed bit.
Fixed Disk 0 Failure or Fixed Disk 1 Failure or Fixed Disk Controller Failure	Fixed disk is not working or not configured properly. Check to see if fixed disk is installed properly. Run Setup be sure the fixed-disk type is correctly identified.
Incorrect Drive A type - run SETUP	Type of floppy drive for drive A: not correctly identified in Setup.
Incorrect Drive B type - run SETUP	Type of floppy drive for drive B: not correctly identified in Setup.
Invalid NVRAM media type	Problem with NVRAM (CMOS) access.
Keyboard controller error	The keyboard controller failed test. Try replacing the keyboard.
Keyboard error	Keyboard not working.
Keyboard error nn	BIOS discovered a stuck key and displays the scan code nn for the stuck key.
Keyboard locked - Unlock key switch	Unlock the system to proceed.
Monitor type does not match CMOS - Run SETUP	Monitor type not correctly identified in Setup.
Operating system not found	Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Continued

Table 5: BIOS Error Messages (continued)

Error Message	Explanation
Parity Check 1	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Parity Check 2	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Press <F1> to resume, <F2> to Setup	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change any settings.
Real time clock error	Real-time clock fails BIOS test. May require Motherboard repair.
Shadow RAM Failed at offset: *nnnn*	Shadow RAM failed at offset *nnnn* of the 64 KB block at which the error was detected.
System battery is dead - Replace and run SETUP	The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
System cache error - Cache disabled	RAM cache failed the BIOS test. BIOS disabled the cache.
System CMOS checksum bad - run SETUP	System CMOS RAM has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. Run Setup and reconfigure the system either by getting the default values and/or making your own selections.
System RAM Failed at offset: *nnnn*	System RAM failed at offset *nnnn* of the 64 KB block at which the error was detected.
System timer error	The timer test failed. Requires repair of system Motherboard.

Port 80h POST Codes

During the POST, the BIOS generates diagnostic progress codes (POST codes) to I/O port 80h. If the POST fails, execution stops and the last POST code generated is left at port 80h. This code is useful for determining the point where an error occurred.

Displaying the POST codes requires an add-in card (often called a POST card). The POST card can decode the port and display the contents on a medium such as a seven-segment display.

The following table provides the POST codes that can be generated by the BIOS. Some codes are repeated in the table because that code applies to more than one operation.

Table 6: Port 80h Codes

Code	Description of POST Operation
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved.
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap(optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. Iftest fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into therun time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved

1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W Interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: Enumerate PCI bus number Assign memory & I/O resource Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	? Program CPU internal MTRR (P6 & PII) for 0-640K memory address. ? Initialize the APIC for Pentium class CPU. ? Program early chipset according to CMOS setup. Example: onboard IDE controller. ? Measure CPU speed. ? Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language 2. 2. Put information on screen display, including Award title, CPU type, CPU Speed.
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved

3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initalize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case thecacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. 2. Initialize Init_Onboard_AUDIO switch.
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call:

	INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”.
6Eh	Reserved
70h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo) 3. 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code

94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Chapter 4: System BIOS

What is the BIOS?

The BIOS (Basic Input Output System) is an important piece of software which is stored in a ROM (Read Only Memory) chip inside the computer. It consists of the basic instructions for controlling the disk drives, hard disk, keyboard and serial/parallel ports. The BIOS also keeps a list of the specifications of the computer in battery-backed RAM (also known as the CMOS RAM) and provides a special Setup program to change this information.

The Power-on sequence

When the computer is first switched on, certain instructions in the BIOS are executed to test various parts of the machine. This is known as the POST (Power-On Self Test) routine. When you switch the computer on (or when you press the Reset button or press <CTRL> + <ALT> + <DELETE> keys, which has the same effect), you can see on the monitor that it counts through the memory, testing it. The floppy disk drives are then accessed and tested, and the various interfaces are checked. If there are any errors, a message is displayed on the screen.

Having passed all the tests, and if you have activated the password facility, the BIOS then asks you to enter the boot password to continue. The following section describes how to do this. The BIOS then loads the operating system, either - Windows 2000 or Windows XP, etc. - from the hard disk (or floppy disk if one is inserted in Drive A:). The computer is then ready for use.

Overview of BIOS Features

Introduction

The Motherboard uses an Award BIOS, which is stored in a flash EEPROM and can be upgraded using a disk-based program. In addition to the BIOS, the flash memory contains the Setup program, Power-On Self Test (POST), the PCI auto-configuration utility, and is Windows 95-ready Plug and Play. This Motherboard supports system BIOS shadowing, allowing the BIOS to execute from 64-bit onboard write-protected DRAM.

The BIOS displays a message during POST identifying the type of BIOS and the revision code.

How Data is configured

The BIOS provides a Setup utility in ROM that is accessed by pressing <Del> at the appropriate time during system boot. Setup configures data in CMOS RAM.

BIOS Upgrades

A new version of the BIOS can be upgraded from a diskette using the utility that is available from Viglen. This utility does BIOS upgrades as follows:

- Updates the flash BIOS from a file on a disk.
- Updates the language section of the BIOS.
- Makes sure that the upgrade BIOS matches the target system to prevent accidentally installing a BIOS for a different type of system.

BIOS Features

- Supports Plug and Play V1.0A and DMI 2.3.
- Supports Intel PCI 2.2 (Peripheral Component Interconnect) local bus specification.
- Supports Advanced Power Management (APM) specification v 1.1.
- Supports ACPI.
- Supports Flash ROM.

The BIOS supports system event logging, which displays a message upon boot up. The parameters monitored are:

- CPU temperature.
- System temperature.
- Error Correcting Code, which measures the accuracy of data as it passes in and out of memory.
- PCI bus activity monitor.

Plug and Play: PCI Auto-configuration

The BIOS automatically configures PCI devices and Plug and Play devices. PCI devices may be onboard or add-in cards. Plug and Play devices are ISA add-in cards built to meet the Plug and Play specification. Auto-configuration lets a user insert or remove PCI or Plug and Play cards without having to configure the system. When a user turns on the system after adding a PCI or Plug and Play card, the BIOS automatically configures interrupts, the I/O space, and other system resources. Any interrupts set to Available in Setup are considered to be available for use by the add-in card.

PCI interrupts are distributed to available ISA interrupts that have not been assigned to an ISA card or to system resources. The assignment of PCI interrupts to ISA IRQs is non-deterministic. PCI devices can share an interrupt, but an ISA device cannot share an interrupt allocated to PCI or to another ISA device. Auto-

configuration information is stored in the extended system configuration data (ESCD) format.

PCI IDE Support

If Auto is selected as a primary or secondary IDE in Setup, the BIOS automatically sets up the two local-bus IDE connectors with independent I/O channel support. The IDE interface supports hard drives up to PIO Mode 4 and recognises any ATAPI devices, including CD-ROM drives, tape drives and Ultra DMA drives. Add-in ISA IDE controllers are not supported. The BIOS determines the capabilities of each drive and configures them so as to optimise capacity and performance. To take advantage of the high-capacity storage devices, hard drives are automatically configured for logical block addressing (LBA) and to PIO Mode 3 or 4, depending on the capability of the drive. To override the auto-configuration options, use the specific IDE device options in Setup. The ATAPI specification recommends that ATAPI devices be configured as shown in Table 7.

Table 7: Recommendations for Configuring an ATAPI Device

	Primary Cable	
Configuration	Drive 0	Drive 1
Normal, no ATAPI	ATA	
Disk and CD-ROM for enhanced IDE systems	ATA	
Legacy IDE system with only one cable	ATA	ATAPI
Enhanced IDE with CD-ROM and a tape or two CD-ROMs	ATA	

Desktop Management Interface (DMI)

Desktop Management Interface (DMI) is an interface for managing computers in an enterprise environment. The main component of DMI is the management information format (MIF) database, which contains information about the computing system and its components. Using DMI, a system administrator can obtain the system types, capabilities, operational status, and installation dates for system components. The MIF database defines the data and provides the method for accessing this information. The BIOS enables applications such as Intel LANDesk® Client Manager to use DMI. The BIOS stores and reports the following DMI information:

- BIOS data, such as the BIOS revision level.
- Fixed-system data, such as peripherals, serial numbers, and asset tags.
- Resource data, such as memory size, cache size, and processor speed.
- Dynamic data, such as event detection and error logging.

Language Support

The Setup program and help messages can be supported in 32 languages. The default language is American English, which is present unless another language is programmed into the BIOS using the flash memory update utility.

Boot Options

In the Setup program, the user can choose to boot from a floppy drive, hard drive, CD-ROM, or the network. The default setting is for the floppy drive to be the primary boot device and the hard drive to be the secondary boot device. By default the third and fourth devices are disabled.

Booting from CD-ROM is supported in compliance to the El Torito bootable CD-ROM format specification. Under the Boot menu in the Setup program, CD-ROM is listed as a boot device. Boot devices are defined in priority order. If the CD-ROM is selected as the boot device, it must be the first device.

The network can be selected as a boot device. This selection allows booting from a network add-in card with a remote boot ROM installed.

BIOS Setup Access

Access to the Setup program can be restricted using passwords. User and supervisor passwords can be set using the Security menu in Setup. The default is no passwords enabled.

BIOS Recovery

Some types of failure can destroy the BIOS. For example, the data can be lost if a power outage occurs while the BIOS is being updated in flash memory. The BIOS recovery function allows you to recover your bios image file if the bios flashing procedure fails.

Configuring the Motherboard using BIOS Setup

Before You Begin

CAUTION!

- **Always follow the steps in each procedure in the correct order.**
- **Set up a log to record information about your computer, such as model, serial numbers, installed options, and configuration information.**
- **Use an anti-static wrist strap and a conductive foam pad when working on the Motherboard.**

WARNINGS!

The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

Disconnect the computer from its power source and from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or perform any procedures can result in personal injury or equipment damage. Some circuitry on the Motherboard may continue to operate even though the front panel power button is off.

CAUTION!

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the computer chassis.

This section describes the various options and functions available on the BIOS of the VIG385P Motherboard. The BIOS allows various features of the Motherboard to be enabled or disabled, such as plug and play as described before.

BIOS Setup Program

The Setup program is for viewing and changing the BIOS settings for a computer. Pressing the **Delete** key after the POST memory test begins and before the operating system boot begins accesses setup.

The table below shows the function keys available for use in the menu screens.

Table 8: BIOS Navigation

Setup Key	Description
Esc or <Alt X>	Exits the menu.
<? > and <? >	Selects fields in the current menu
<? > and <? >	Selects menus on menu bar
<Home>/<End>	Moves to the top/bottom item of current menu.
<Pg up> and <Pg Dn>	Moves to the previous/next page on scrollable menus.
<F5> or <->	Selects next lower value
<F6>, <+> and <Space>	Selects next higher value
<Enter> or <Return (?)>	Selects Sub Menus
<F9>	Loads default settings
<F10>	Saves current settings and exits Setup
<F1> or <Alt + H>	Help

Main BIOS Setup

All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main Menu

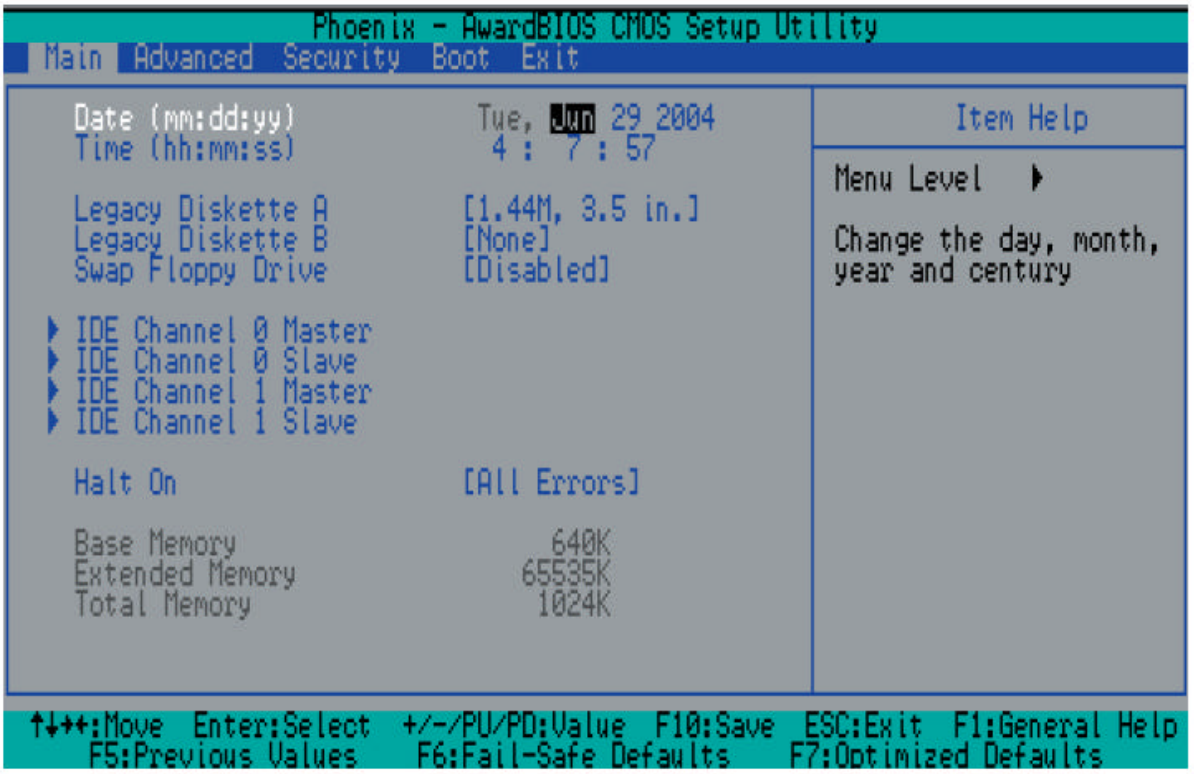


Figure 13: Main Menu

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Legacy Diskette B

This setting allows the user to set the type of floppy disk drive installed as diskette B. The options are **Disabled**, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, 1.44/1.25MB, 3.5 in and 2.88MB 3.5 in.

Primary Master/Primary Slave Sub-Menu

These settings allow the user to set the parameters of the IDE Primary Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

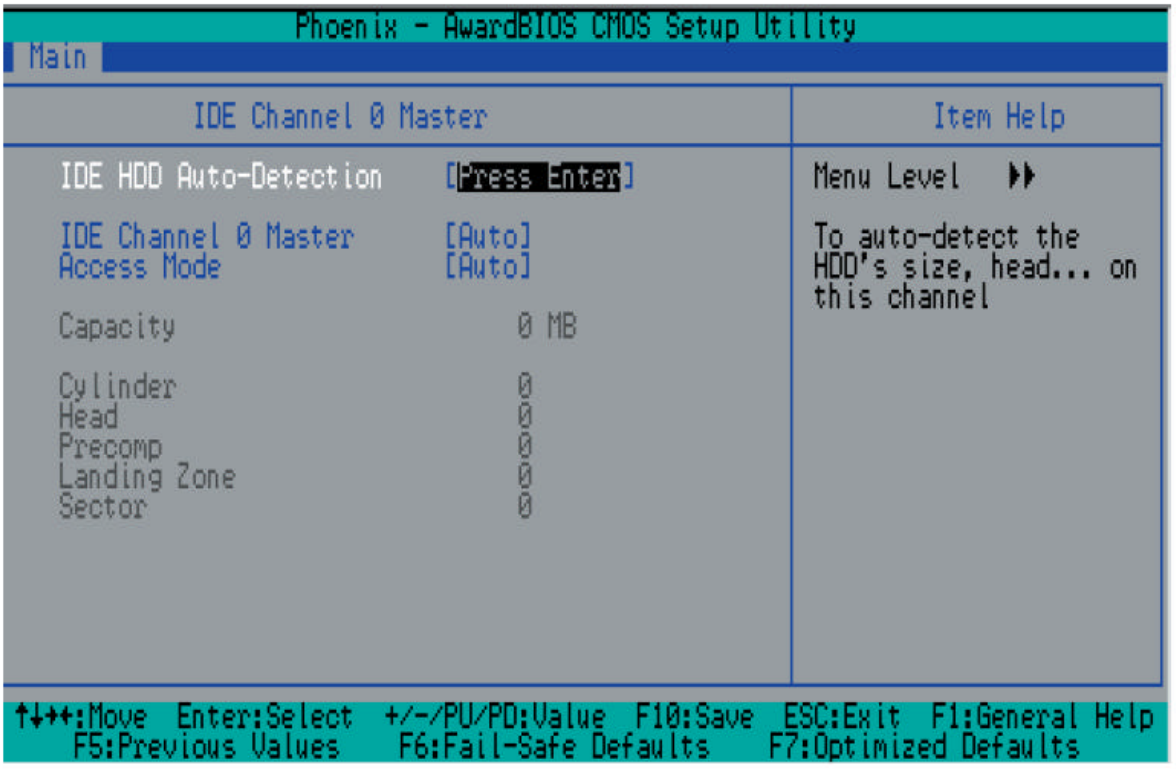


Figure 14: Primary Master/Primary Slave/Secondary Master/Secondary Slave Sub-Menu

IDE HDD Auto-Detection

This option allows the user to determine the manner in which the Award BIOS sets the settings for the IDE Primary Master Device. The options are "None", "**Auto**" and "Manual."

IDE Primary Master

Press the <Enter> key to activate the 'IDE HDD Auto-Detection" function, which will allow BIOS to automatically detect the status of the IDE HDD installed in the system, such as the size, the number of cylinders, the configurations of items such as Head, Precomp, Landing Zone and Sector.

Access Mode

This item determines the location through which the Award BIOS accesses the IDE Primary Master Device. The settings are "CHS", "LBA", "Large", and "**Auto**".

Base Memory/Extended Memory/Total Memory

These are displays that inform you how much of each type of memory is recognized as being present in the system.

Advanced BIOS Setup

Choose Advanced BIOS Setup from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display. Select one of the items in the left frame of the screen to go to the sub screen for that item. Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.

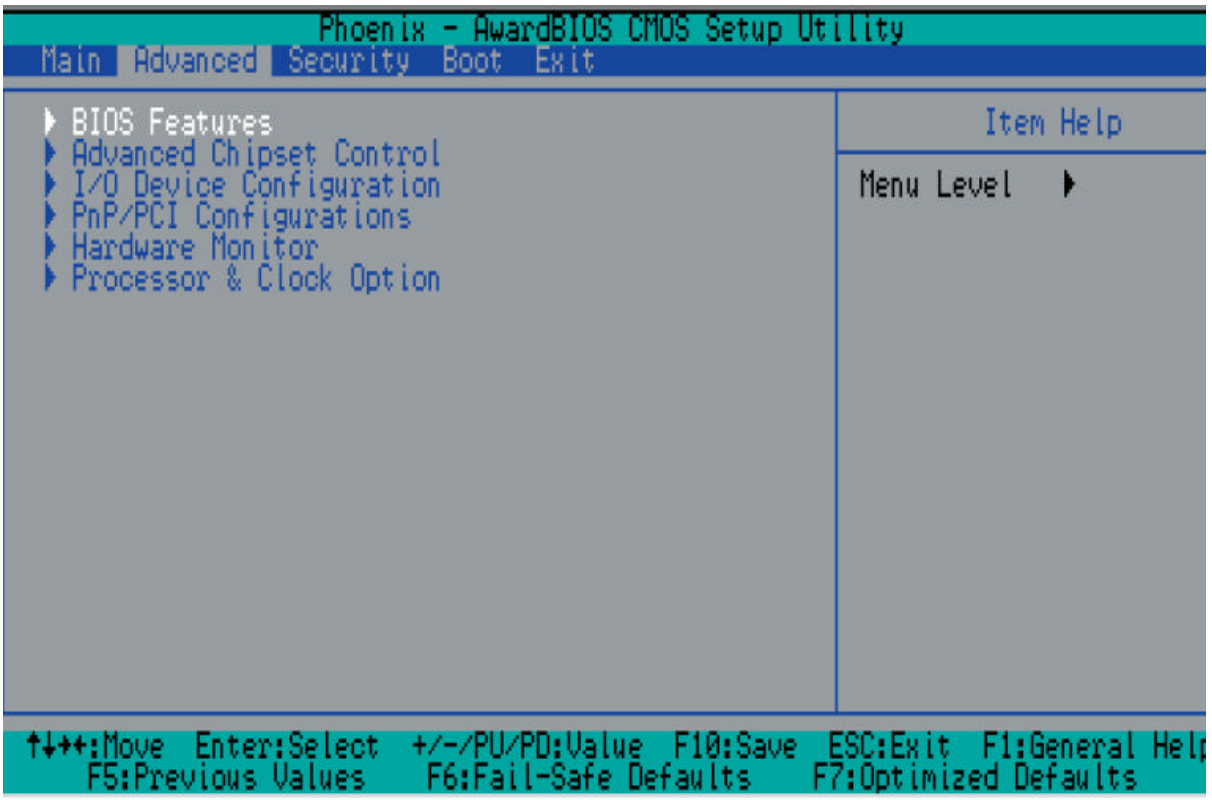


Figure 15: Advanced Menu

Advanced BIOS Features

When the item of Advanced BIOS Features is highlighted, press the <Enter> key to activate the screen below:

Quick Boot

If enabled, this feature allows the system to skip certain tests while booting. This will decrease the time needed to boot the system. The settings are "**Enabled**" and "Disabled".

Quiet Boot

This feature allows the user to activate the function of "Quiet Boot". "**Enabled**" and "Disabled".

ACPI Function
Select "Enabled" to activate the function of BIOS Support for Advanced Configuration and Power Interface features. The settings are "**Enabled**" or "Disabled".

ACPI Suspend Type
If enabled, the option allows the user to determine the ACPI Suspend type. The options are **S1 (POS)**, S3 (STR), and S1&S3.

APIC Mode
This setting allows you to **Enable** or Disable APIC. APIC is used to assign interrupt signals to a specific processor on multi-processor system and provides IRQs beyond the conventional 16 under Windows 2000 or XP. It has no effect on single processor systems.

MPS Version Control for OS
This setting allows you to state the MPS version for your operating system. Options are "1.1" and "**1.4**".

PWRON After PWR-Fail
This setting allows the user to specify how the system will respond when power is reapplied after the system has gone down due to a power failure. The options are "**Off**", "On" and "Former-Sts".

Advanced Chipset Control

Graphics Apertures
This option allows the BIOS to set the size of system memory reserved for AGP Graphic access. The options are 4, 8, 16, 32, 64, **128**, and 256.

CSA LAN(Giga-LA)
This setting allows you to enable or disable the CSA (GLAN) Controller. The options are "**Enabled**", and "Disabled."

On-Chip VGA
This setting allows you to enable or disable On-Chip VGA Controller. The options are "**Enabled**", and "Disabled."

On-Chip Frame Buffer Size
This setting allows you to set On-Chip Frame Buffer Size. The options are "1 MB", "4 MB", "8 MB", "**16 MB**" and "32 MB."

Onboard LAN
This setting allows you to enable or disable the Onboard LAN Controller. The options are "**Enabled**", and "Disabled."

USB Controller
This setting allows you to enable or disable the USB Controller. The options are **Enabled**, and Disabled.

USB 2.0 Controller
This setting allows you to enable or disable USB 2.0 (EHCI) Controller. The options are **Enabled**, and Disabled.

USB Legacy Support
This setting allows you to enable or disable the functions of USB, Keyboard/Mouse under POST and DOS. The options are **"Disabled"**, and "Enabled."

USB KB Wake-Up From S3
This setting allows you to enable or disable the function of USB KB Wake-Up from S3. The options are **"Disabled"**, and "Enabled."

AC97 Audio
Select "Disable" to disable AC 97 Controller. Select "Auto" to allow the BIOS select AC97 automatically. The options are **"Auto"**, and "Disabled."

CPU THRM-Throttling
THRM throttling is used to lower power consumption and reduce the heat generated by the CPU. The options for this setting are "**87.5%**", "75%".

I/O Device Configuration

Onboard Serial Port1/Onboard Serial Port2
This setting allows the user to set the address and the corresponding IRQ for the Serial Port1 and Serial Port 2. The options are "Disabled", "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3", and "Auto". The default setting for Serial Port1 is "**3F8/IRQ4**" and the default for Port 2 is "**2F8/IRQ3**".

UART Mode Select
This setting allows the user to select the UART mode for the BIOS. The options are "IrDA", "ASKIR" and "**Normal**."

RxD, TxD Active
This allows the user to change the settings for the "RxD, TxD Active" function. The options are "Hi, Hi", "**Hi, Lo**", "Lo, Hi", and "Lo, Lo".

IR Transmission Delay
If "Enabled", the transmission of IR (infrared) signals will be delayed. The options are "**Enabled**" and "Disabled".

UR2 Duplex Mode
This setting set the mode for the UR2 Duplex Mode. The options are "Full" and "**Half**".

Use IR Pins
This item sets the usage of the IR pins. The options are "RxD2, TxD2" and "**IR-Rx2Tx2**".

Parallel Port Mode
This setting sets the mode for the onboard Parallel port. The options are "**SPP**," "EPP", "ECP" "ECP+EPP" and "Normal".

EPP Mode Select
This setting allows the user to select the EPP port type. The options are "EPP 1.9" and "**EPP 1.7**".

Onboard Parallel Port
This setting allows the user to set the address and the corresponding IRQ for the onboard parallel port. The options are "Disabled", "**378/IRQ7**", "278/IRQ5" and "3BC/IRQ7".

Parallel Port Mode
This setting sets the mode for the onboard Parallel port. The options are "**SPP**," "EPP", "ECP" "ECP+EPP" and "Normal".

EPP Mode Select
This setting allows the user to select the EPP port type. The options are "EPP 1.9" and "**EPP 1.7**".

ECP Mode Use DMA
This setting allows the user to select the DMA channel for the ECP mode (port) to use. The options are "1" and "**3**".

Game Port Address
This setting allows the user to set the address for the Game Port. The options are "Disabled", "**201**" and "209".

Midi Port Address
This setting allows the user to set the address for the Midi Port. The options are "Disabled", "**330**", "300" and "290".

Midi Port IRQ
This setting allows the user to set the IRQ for the Midi Port. The options are "5", and"**10**".

Watch Dog Timer Select
This setting allows you to set the Watch Dog Timer. You must also change the setting of the Watch Dog jumper in order for this function to work well (-see jumper settings in Chapter 2). Options are "10 Sec", "20 Sec", "30 Sec", "40 Sec", "1 Min", "2 Min", "4 Min" and "**Disabled**".

Power On Function

This setting allows the user to decide which method to use to power on the system. The options are "Password", "Hot Key", "Mouse Left", "Mouse Right", "Any Key", and "**Button Only**".

KB Power On Password

This setting allows the user to enter the Password when the system is powered on via keyboard.

Hot Key Power On

This setting allows the user to decide which hot-keys to use in order to power on the system. The options are "**Ctrl-F1**", "Ctrl-F2, Ctrl-F3", "Ctrl-F4", "Ctrl-F5", "Ctrl-F6", "Ctrl-F7", and "Ctrl-F8".

PnP Configuration

Choose PCI/PnP Configurations from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

Initial Display From

This feature sets the device that will initiate the monitor display when the system is first turned on. The Options are "PCI Slot" and "**Onboard/AGP**".

Resources Controlled By

This setting allows BIOS to automatically configure all boot and Plug and Play compatible devices. If you choose Auto, you cannot select the IRQ, DMA and memory base address fields, because BIOS automatically assigns them. The options are "**Auto <ESCD>**" and "Manual".

Reset Configuration Data

Enabling this setting resets the extended system configuration data when you exit setup. Do this when you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot reboot the system. The options are "Enabled" and "**Disabled**".

Hardware Monitors

CPU Warning Temperature

This allows you to set the CPU warning temperature. If the CPU temperature reaches this threshold, an alarm will activate and a warning message will be displayed onscreen. The options are "Disabled", "600C/1400F", "650C/1490F", "700C/1580F", "**750C/1670F**", "800C/1760F" and "850C/1850F".

Processor & Clock Options

Hyper-Threading

Set this option to "Enabled" to activate the hyper-threading function of the CPUs. Enabling the hyper-threading function makes each CPU appear as two to any programs that support it (you must have OS support also).The settings are "Disabled" and "**Enabled**."

CPU Clock Ration

Use this option to set the clock ratio of the processor. The settings are "**x8**" "x9", "x10", "x11", "x12", "x13", "x14", "x15", "x16", "x17", "x18", "x19", "x20", "x21", "x22" and "x23".

Spread Spectrum

Spread Spectrum is a technique used to stablize a system by reducing the level of Electromagnetic Interference. The options are "Enabled" and **"Disabled"**.

CPU Clock

Key in the number you want to set for the CPU clock (MHz). Viglen does not recommend or make any guarantees with CPU overclocking.

Security

Choose Security from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

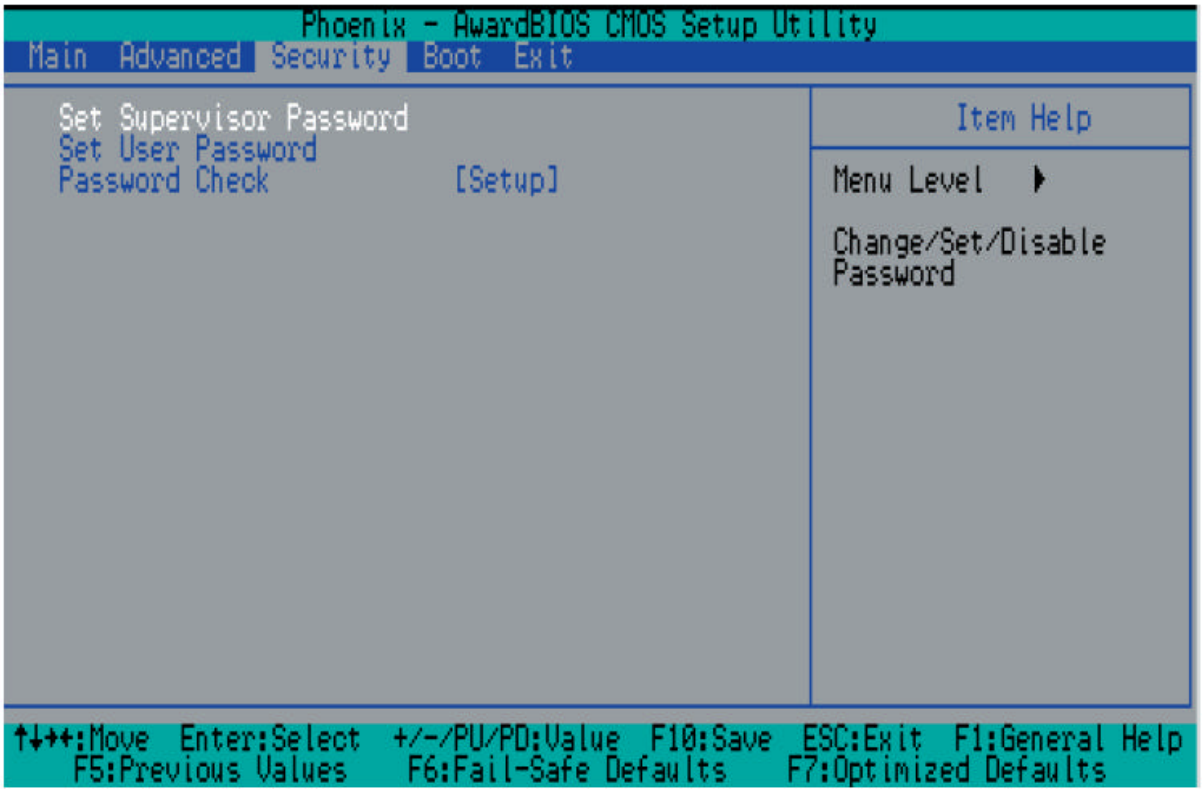


Figure 16: Security

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the Supervisor Password in the dialogue box to set or to change the Supervisor Password.

Set User Password

When the item "Set User Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the User Password in the dialogue box to set or to change the User Password.

Password Check

This setting allows the user to determine if the password is required every time when the system boots up or if the password is required only when you enter the CMOS setup. The options are "System" and "**Setup**".

Fixed Disk Boot Sector

This setting allows the user to configure the Fixed Disk Boot Sector. The default setting is "**Protected**".

Boot

Choose Boot from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

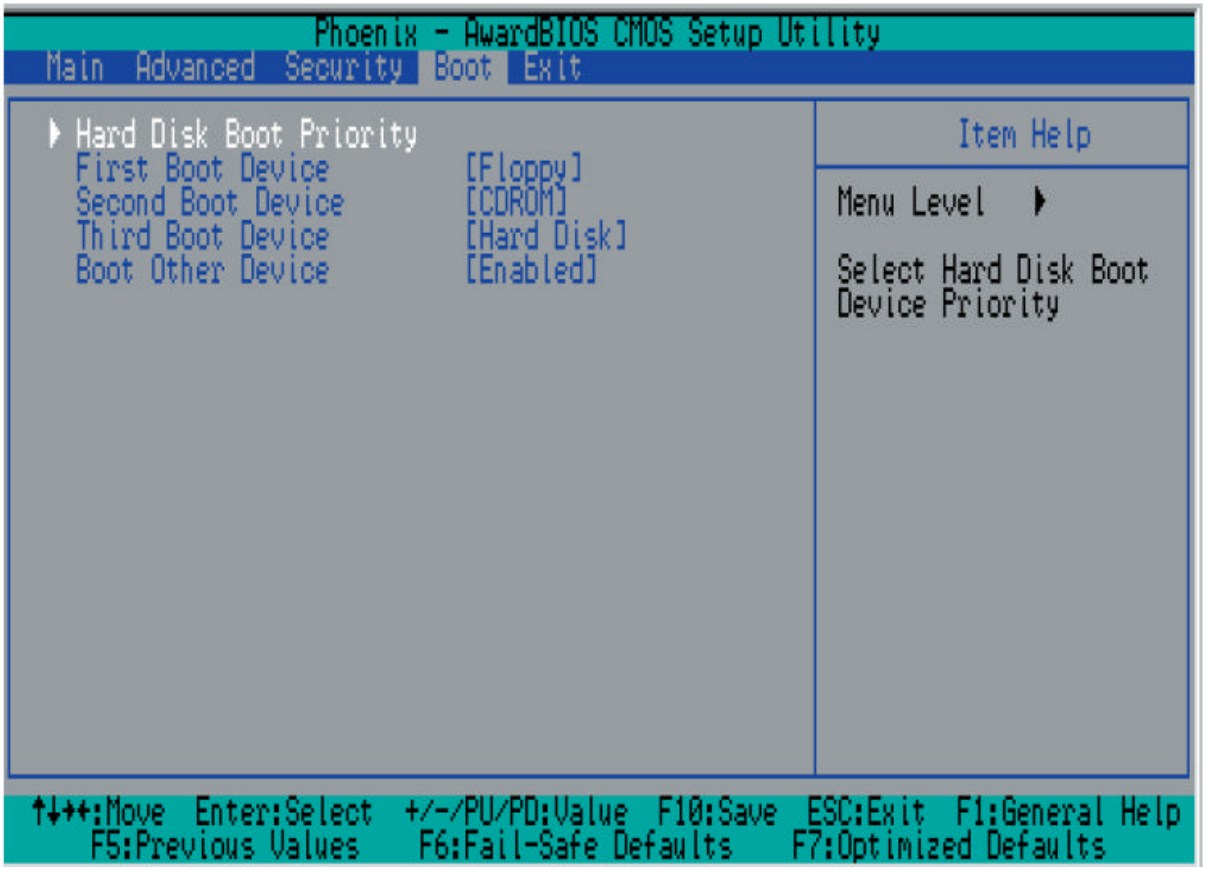


Figure 17: Hard Disk Boot Priority

Hard Disk Boot Priority

This item allows the user to select the Boot Priority of Hard Disk Devices.

First Boot Device

This item allows the user to set the first boot-up device. The options are "Floppy", "LS120", "HDD", **"CDROM",** "ZIP100", "USB-FDD", "USB-ZIP", "USBCDROM", "USB-HDD", "LAN" and "Disabled".

Second Boot Device

This item allows the user to set the second boot-up device. The options are **"Floppy"**, "LS120", "HDD", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Third Boot Device

This item allows the user to set the third boot-up device. The options are "Floppy", "LS120", "**HDD**", "SCSI", "CDROM", "ZIP100", "USB-FDD", "USBZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Boot Other Device

If enabled, this option enables the BIOS to load the OS from another device rather than the ones that have been specified as the first, second and third boot up devices. The settings are "**Enabled**" and "Disabled".

Exit

Choose Exit from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:

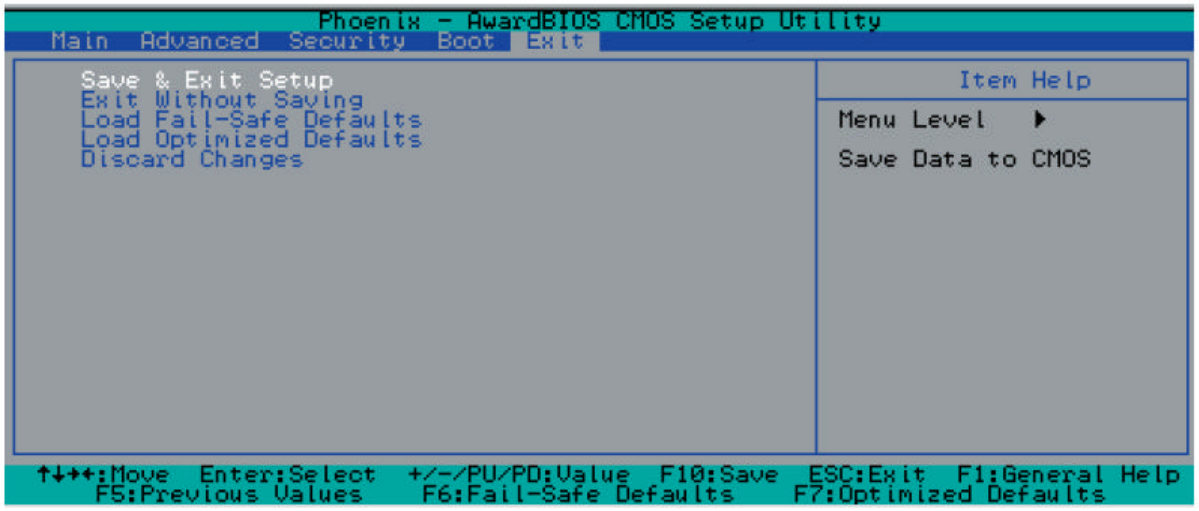


Figure 18: Save & Exit Setup

Save & Exit Setup

When the item "Save & Exit Setup" is highlighted, press <Enter> to save the changes you've made in the BIOS program (CMOS) and exit. Your system should, then, continue with the boot-up procedure.

Exit without Saving

When the item "Exit without Saving" is highlighted, press <Enter> to exit the Setup routine without saving any changes you may have made. Your system should then continue with the boot-up procedure.

Load Fail-Safe Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Load Optimized Defaults

Highlight this item and hit <Enter> to load the optimized settings for all items in the BIOS Setup. These settings provide you with optimal system performance.

Discard Changes

When the item "Discard Changes" is highlighted, press <Enter> to discard any changes you made to the BIOS settings and to stay in BIOS Setup. Your system should then continue with the boot-up procedure.

Upgrading the BIOS

Preparing for the Upgrade

Before you upgrade the BIOS, prepare for the upgrade by recording the current BIOS settings, obtaining the upgrade utility, and making a copy of the current BIOS.

Obtaining the Upgrade Utility

You can upgrade to a new version of the BIOS using the new BIOS files and the BIOS upgrade utility, iFLASH.EXE. You can obtain the BIOS upgrade file and the iFLASH.EXE utility through your computer supplier or from the Intel World Wide Web site:

http://www.viglen.co.uk

***Note:* Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.**

This upgrade utility allows you to: Upgrade the BIOS in flash memory.

The following steps explain how to upgrade the BIOS. The following steps explain how to upgrade the BIOS. Please follow all the step's accurately.

Recording the Current BIOS Settings

1. As the computer boots, write down the BIOS identifier (version number) so a check can be made later to make sure the upgrade was successful.

2. Boot the computer and press <**Delete**> when you see the message:

   Press <**Delete**> Key if you want to run SETUP

3. Write down the current settings in the BIOS Setup program.

***NOTE:* DO NOT SKIP STEP 3. YOU WILL NEED THESE SETTINGS TO CONFIGURE YOUR COMPUTER AT THE END OF THE PROCEDURE.**

Creating a Bootable Floppy Diskette

1. Use a DOS or Windows 95/98 system to create the floppy disk.

2. Place an unformatted floppy diskette in the floppy drive and format the floppy using the /S option. example: "**Format a: /s**"
3. Alternatively, place a formatted floppy in the floppy drive and use the "sys" command. example: "**sys a:**"

4. Press **Enter**

Creating the BIOS Upgrade Floppy Diskette

The BIOS upgrade file is a compressed self-extracting archive that contains the files you need to upgrade the BIOS.

1. Copy the BIOS upgrade file to a temporary directory on your hard disk.

2. Extract the files and then copy them to a bootable floppy disk.

3. Read the README.TXT file, which contains the instructions for the BIOS upgrade.

Upgrading the BIOS

1. Boot the computer with the floppy disk in drive A.

One of the files copied will take the form DA8xxxx.bin The “xxxx” represents the BIOS version identifier.

2. At the DOS prompt, enter the command “AWDFlash filename.bin /py/wb/cd/sn/cc/r/f” This will start the flash utility.

3. When the utility displays the message upgrade is complete, press any key to restart or power off the system.

4. As the computer boots, check the BIOS identifier (version number) to make sure the upgrade was successful.

5. To enter the Setup program, press **Delete** when you see the message: *Press Del if you want to run SETUP*

6. Load the BIOS setup defaults.

7. Set the options in the Setup program to the settings you wrote down before the BIOS upgrade.

8. Turn off the computer and reboot.

Chapter 5: Technical Information

***Note:* This chapter is indented for experienced users only, and only to be used as a reference. Changes to or modify any of the components/ connectors listed herein can and will seriously damage your system, including the Motherboard, CPU and/or any other hardware.**

IDE Controller

IDE is a 16 bit interface for intelligent disk drives with disk controller electronics onboard. The device controls:

- PIO and IDE DMA/bus master operations
- Mode 4 timings
- Transfer rates up to 100 MB/s
- Buffering for PCI/IDE burst transfers
- Master/slave IDE mode

***Note:* 18 inch maximum length of IDE cable on each channel: You can connect an IDE signal cable, up to a maximum of 18 inches each, to each IDE connector on the system board. Each cable can support two devices, one at the end of the cable and one 6 inches from the end of the cable.**

Operating Systems and IDE hard drives

Standard CHS is the translation that has been used for years. Its use limits IDE capacity to maximum of 528MB regardless of the size of the drive used.

Logical Block mode overcomes the 528MB maximum size limitation imposed by the Standard CHS mode. It should be used only when the drive supports LBA (Logical Block Addressing), and the OS supports LBA, or uses the BIOS to access the disk.

Extended CHS mode also overcomes the 528MB maximum size limitation imposed by Standard CHS mode. It can be used with drives, which are larger than 528MB that do not support LBA.

Auto Detected allows the BIOS to examine the drive and determine the optimal mode. The first choice is to utilise Logical Block mode if it is supported by the drive. The second choice is to utilise Extended CHS mode if the drive topology allows. If neither of the above methods is possible, the Standard CHS mode is used.

Different operating systems have different abilities regarding IDE translation mode.

UNIX operating systems (as currently implemented) do not support either LBA or ECHS and must utilise the standard CHS method. UNIX can support drives larger than 528MB, but does so in its own way.

OS/2 2.1 and OS/2 Warp can support LBA, ECHS or standard CHS methods. Note that LBA support may require a switch setting on an OS/2 driver in order to operate in that mode.

OS/2 2.0 & Novel NetWare can support either ECHS or standard CHS methods. In order to use LBA with NetWare a driver that supports current parameters must be used. OS/2 2.0 does not support LBA.

DOS & Windows can use LBA, ECHS or standard CHS methods. The '32-bit Disk Access' driver built into Windows WDCTRL.386 can only be used with the standard CHS method, to use either LBA or ECHS method and '32-bit Disk Access' an alternative .386 driver must be installed; this combination will also provide the best performance. If this driver is not installed and the drive fitted to the system supports Type F DMA on the ISA interface or Mode 3 on the PCI interface then higher performance will be achieved by NOT using '32-bit Disk Access'.

Network Controllers

The VIG385P Motherboard includes an Intel 82573V PCI-e Gigabit Ethernet Controller (supporting 10, 100, 1000Mbs) network solution. As a PCI 2.2 bus master, the controller can burst data at up to 132 MB/s. The controller contains two receive and transmit FIFO buffers that prevent data overruns or under runs while waiting for access to the PCI bus. The controller has the following:

Serial ATA

The VIG385P consists of four S-ATA connections. In order to use these ports the S-ATA option in the bios must first be enabled and the relevant S-ATA Motherboard jumpers must be set correctly on the enable pins.

Refer to the jumper and bios pages for more details on enabling SATA.

Connector Pin Signal Details

ATX Power Connector

The primary power supply connector (J40) on the PDSLA/PDSLE meets the SSI (Superset ATX) 24-pin specification. Refer to the table below for the pin definitions of the ATX 24-pin power connector. You must also connect the 4-pin (J41) processor power connector to your power supply. Refer to the table below for the J41 (12V) connector.

ATX Power Supply 24-pin Connector Pin Definitions (J20)

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Required Connection

+12V 4-pin Connector (J41)

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

Power LED

The Power LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the below for pin definitions.

PWR_LED Pin Definitions (JF1)

Pin Number	Definition
15	LED_Anode
16	PWR LED Sig.

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SCSI, Serial ATA and IDE). See the table below for pin definitions.

HDD LED Pin Definitions (JF1)

Pin Number	Definition
13	LED_Anode
14	HD Active

Overheat LED (OH)

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or system fan failure. Refer to the table below for pin definitions.

Overheat (OH)/ Fan_Fail LED Pin Definitions (JF1)

Pin #	Definition
7	LED_Anode
8	OH/Fan Fail LED Sig.

OH/Fan Fail LED (JF1)

State	Message
Off	Normal
Stay On	Overheat
Blink	Fan Fail

Power Button

The PW_ON connector is located on pins 1 and 2 of JF1. Connect it to the chassis power button, which you may also configure to put the system into suspend mode (see the Power Button Mode setting in BIOS). To turn off the power when the suspend mode is enabled, depress the power button for at least 4 seconds. See the table on the right for pin definitions.

PW_ON Pin Definitions (JF1)

Pin #	Definition
1	Signal
2	GND

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located beside the PS/2 ports. USB0 is the bottom connector and USB1 is the top connector. See the table below for pin definitions.

USB Pin Definition

J44 & J11

Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground

J43

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

Front Panel Universal Serial Bus Headers

Extra USB headers (FPUSB0/FPUSB1/FPUSB2/FPUSB3) can be used for front side USB access. You will need a USB cable to use either connection. Refer to the table below for pin definitions.

USB Pin Definition

JPUSB

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

J11

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

Serial Ports

Two serial ports are included on the Motherboard. COM1 (J31) is a port located beside the mouse/keyboard ports and COM2 (J13) is a header located on the Motherboard near PCI-E slot #6. See the table below for pin definitions.

Serial Port Pin Definitions (COM1)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground		

Serial Port Pin Definitions (COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

***Note:* Pin 10 is included on the header but not on the port.**

GLAN (Ethernet Port)

A G-bit Ethernet port (designated GLAN) is located beside the COM1 port on the IO backplane. This port accepts RJ45 type cables.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located at J28. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See the table below for pin definitions.)

PS/2 Keyboard and Mouse Port Pin Definitions (J28)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Fan Headers

There are three fan headers (Fan1, Fan 2 and Fan3) on the VIG385P. (See the table on the right for pin definitions.) These are 4-pin fan headers; however, the traditional 3-wire fans are also supported. (Pins#1-#3 of the fan headers are backward compatible with the traditional 3-pin fans.) When a 3-wire fan is used, it will be set to run at the full speed by default. When a 4-wire fan is used, the CPU and chassis fan speeds will be automatically controlled by the control circuit inside the fan based upon the CPU temperature.

Fan Header Pin Definitions (CPU, Chassis and Overheat)

Pin#	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer
4	PWM_Control

Caution: These fan headers use DC power.

Power LED

The Power LED header is located on JLED. This header provides LED indication of power being supplied to the system. See the table on the right for pin definitions.

JLED Pin Definitions

Pin Number	Definition
1	Anode
2	Key
3	Cathode

Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table below for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring
Pin Definitions
(JWOR)

Pin Number	Definition
1	Ground
2	Wake-up

Jumper Settings

Explanation of Jumpers

To modify the operation of the Motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the Motherboard layout pages for jumper locations.

***Note:* On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.**

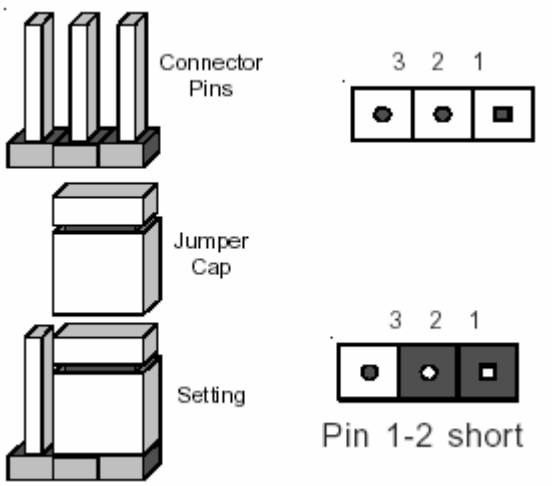


Figure 19: Explanation of Jumpers

CMOS Clear

JBT1 is used to clear CMOS. In-stead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS. JBT1 is located near the SATA header on the Motherboard.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. Do not use the PW_ON connector to clear CMOS.

USB Wake-Up

Jumper JPUSB is used in conjunction with the Keyboard Wake-Up function in BIOS when you wish to wake the system up with a USB keyboard that has been connected to a USB port (not header). Set JPUSB to pins 1-2 to support USB keyboard wake-up and resume from ACPI S1 mode and pins 2-3 pins to support USB keyboard wake-up and resume from ACPI S3 mode. See the table below for jumper settings.

Note: Your power supply must provide 5v of standby voltage with at least 1A to use this feature.

USB Wake-Up
Jumper Settings
(JPUSB)

Jumper Position	Definition
1-2	5v
2-3	5v Standby

Watch Dog

JP5 enables the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is "hung up". Pins 1-2 will cause WD to reset the system if an application is "hung up". Pins 2-3 will generate a non-maskable interrupt signal for the application that is "hung up". See the table on the right for jumper settings.

Watch Dog
Jumper Settings (JP37)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Keyboard Wake-Up

The JPWAKE jumper is used together with the Keyboard Wake-Up setting in BIOS. Enable both to allow the system to be woken up by depressing a key on the keyboard. See the table below for jumper settings.

Note: ***Your power supply must meet ATX specification 2.01 or higher and supply 720mA of standby power to use this feature.***

Keyboard Wake-Up
Jumper Settings
(JPWAKE)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

System Bus Speed

JP2 & JP3 allows you to select Auto, or Manual speed for your system (front side) bus speed. The recommended Auto setting will automatically determine the system bus speed of your processor(s). See the table below for jumper settings.

Front Side Bus Speeds: JP2, JP3

JP2	JP3	
1-2	1-2	AUTO
2-3	2-3	100 MHz
2-3	NC	133 MHz
NC	2-3	200 MHz
NC	NC	Reserved

"Auto" is the recommended setting.

Parallel Port, Floppy and Hard Disk Drive

Note the following when connecting the floppy and hard disk drive cables:

? The floppy disk drive cable has seven twisted wires.

? A red mark on a wire typically designates the location of pin 1.
? Single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel (Printer) Port Connector

The parallel (printer) port is located on ss. See the table below for pin definitions.

Parallel (Printer) Port Pin Definitions (J7)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Floppy Connector

The Floppy connector is located on JP7. See the table below for Pin definitions.

Floppy Connector Pin Definitions (JP7)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors (at J2 and J3, respectively). See the table below for pin definitions.

Parallel (Printer) Port Pin Definitions (J30)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 1	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Other Information - Reliability

The mean time between failures (MTBF) prediction is calculated using component and subassembly random failure rates. The calculation is based on the Bellcore Reliability Prediction Procedure, TR-NWT-000332, Issue 4, September 1991.

The MTBF prediction is for:

- Redesigning the Motherboard for alternate components if failure rates exceed reliability expectations
- Estimating repair rates and spare parts requirements
- MTBF data is calculated from predicted data @ 35 ?C.
- The MTBF prediction for the Motherboard is 120,402 hours.

Power Management

Power management is implemented at several levels, including:

- Software support through Advanced Configuration and Power Interface (ACPI)
- Hardware support:
    - Power connector
    - Fan connectors
    - LAN wake capabilities
    - Instantly Available PC technology
    - Resume on Ring
    - Wake from USB
    - Wake from PS/2 devices
    - Power Management Event signal (PME#) wake-up support

ACPI

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The use of ACPI with the VIG385P Motherboard requires an operating system that provides full ACPI support. ACPI features include:

- Plug and Play (including bus and device enumeration)
- Power management control of individual devices, add-in boards (some add-in boards may require an ACPI-aware driver), video displays, and hard disk drives
- Methods for achieving less than 15-watt system operation in the power-on/standby sleeping state
- A Soft-off feature that enables the operating system to power-off the computer
- Support for multiple wake-up events
- Support for a front panel power and sleep mode switch

System States and Power States

Under ACPI, the operating system directs all system and device power state transitions. The operating system puts devices in and out of low-power states based on user preferences and knowledge of how devices are being used by applications. Devices that are not being used can be turned off. The operating system uses

information from applications and user settings to put the system as a whole into a low-power state.

Wake-up Devices and Events

Table 9 lists the devices or specific events that can wake the computer from specific states.

Table 9: Wake-up Devices and Events

These devices/events can wake up the computer…	…from this state
LAN	S1, S3, S4, S5
Modem (Back panel Serial Port A)	S1, S3
PME# signal	S1, S3, S4, S5
Power switch	S1, S3, S4, S5
PS/2 devices	S1, S3
RTC alarm	S1, S3, S4, S5
USB	S1, S3

Note: ***The use of these wake-up events from an ACPI state requires an operating system that provides full ACPI support. In addition, software, drivers, and peripherals must fully support ACPI wake events.***

Chapter 6: Glossary

BIOS
This is software stored on a chip and consists of the instructions necessary for the computer to function. The System BIOS contains the instructions for the keyboard, disk drives etc., and the VGA BIOS controls the VGA graphics card.

CPU
Central Processing Unit. This is the main piece of equipment on the Motherboard. The CPU processes data, tells memory what to store and the video card what to display.

Default
The configuration of the system when it is switched on, or the standard settings before any changes are made.

DIMM
Dual In-Line Memory Module, a type of memory module used for the systems main memory.

Driver
A piece of software which is used by application software to control some special features. Each graphics board and printer requires its own driver.

D-Type
A common type of connector used for connecting printers, serial ports, game port, and many other types of interface.

DRAM
Dynamic Ram used for main system memory, providing a moderately fast but cheap storage solution.

FDC
Floppy Disk Controller - the interface for connecting floppy disk drives to the computer.

Hercules
A monochrome graphics video mode which first appeared in the Hercules graphics card. Provides a resolution of 720 by 348 pixels.

IDE
Integrated Drive Electronics - currently the most popular type of interface for hard disk drives. Much of the circuitry previously required on hard disk controller cards is now integrated on the hard disk itself.

Interface
The electronics providing a connection between two pieces of equipment. For example, a printer interface connects a computer to a printer.

Interlace
The mode the graphics card uses to refresh a monitor screen. When the graphics is in interlace mode, the frequency of the display update is lower than in non-interlace mode. This causes a slight flicker, so generally non-interlaced mode is better if the monitor supports it.

L.E.D.
Light Emitting Diode - a light which indicates activity - for example hard disk access.

PCI
Peripheral Component Interface. It became apparent to manufacturers that the 8MHz AT ISA BUS on the standard PC was just not fast enough for today's applications, and so PCI was invented. It is a high speed data bus that carries information to and from components - known as 'Local Bus'.

RAM
Random Access Memory - the memory used by the computer for running programs and storing data.

ROM
Read Only Memory - a memory chip which doesn't lose its data when the system is switched off. It is used to store the System BIOS and VGA BIOS instructions. It is slower than RAM.

RIMM
RAMBUS In-line Memory Module- a type of memory module used for the systems main memory. Faster than conventional DIMMs.

Shadow Memory
The BIOS is normally stored in ROM. On certain systems it can be copied to RAM on power up to make it go faster. This RAM is known as shadow memory. The System BIOS is responsible for this copying.

Super VGA
Additional screen modes and capabilities provided over and above the standard VGA defined by IBM.

VGA
Video Graphics Array - the graphics standard defined by IBM and provided on IBM's PS/2 machines.

Notes

Suggestions

Viglen is interested in continuing to improve the quality and information provided in their manuals. Viglen has listed some questions that you may like to answer and return to Viglen. This will help Viglen help to keep and improve the standard of their manuals.

1. Is the information provided in this and other manuals clear enough?

2. What could be added to the manual to improve it?

3. Does the manual go into enough detail?

4. Would you like an on-line version of this manual?

5. How do you rate the Viglen Technical support and Service Departments?

6. Are there any technological improvements that could be made to the system?

7. Other points you would like to mention?

Please return this slip to: Product Development Department
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